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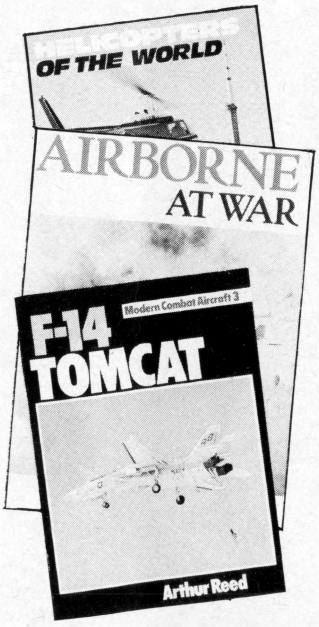

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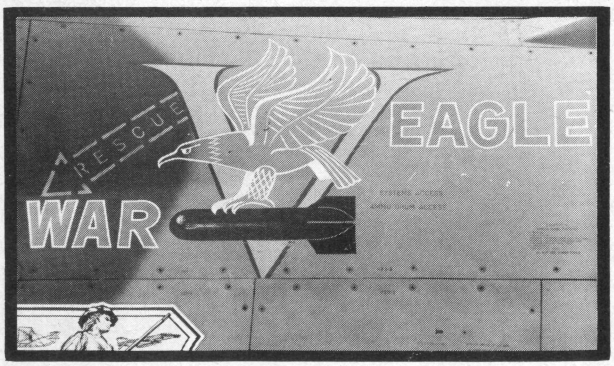
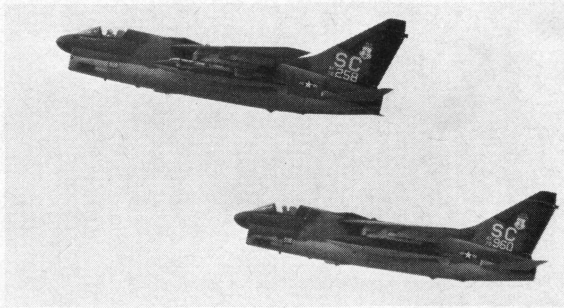
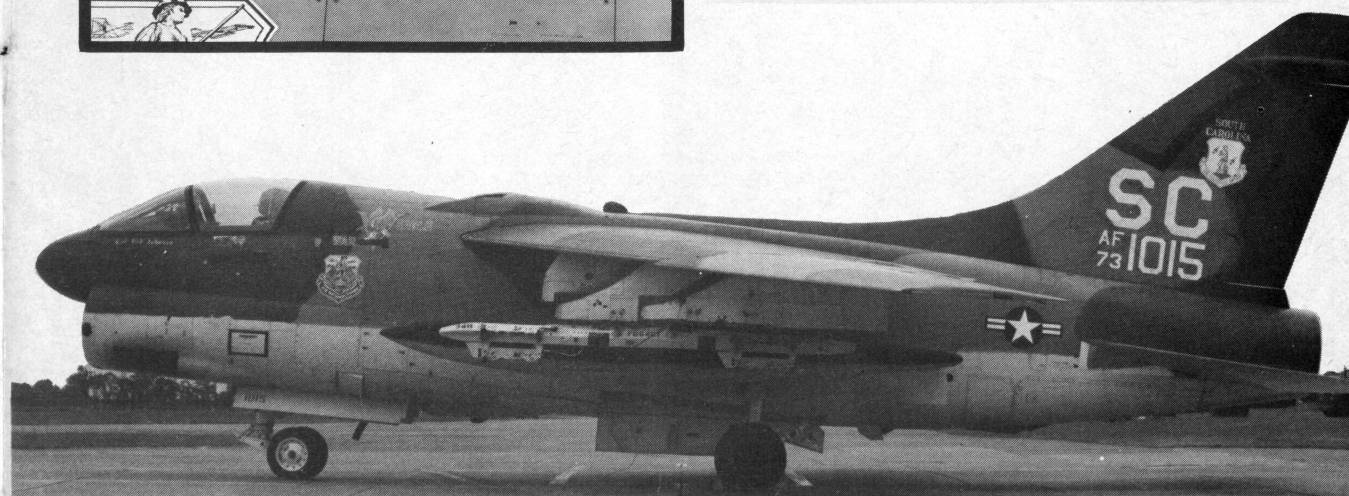
Cover: The flight line outside Meet headquarters during the AAFCE Tactical Air Meet 1978 held at RAF Wildenrath in early June. Jaguar GR1s of No 20 Squadron are seen returning from a sortie, while further up the line are NF-5As of No 316 Squadron R Neths AF, F-4F Phantoms of the GAF's JBG 35 and 36 and, at the far end, F-4Es of USAFE's 50th TFW. *Photo: The Editor*

Frontispiece: The prototype Canadair Challenger wide-body business jet seen after its roll-out at the manufacturers Cartierville, Montreal plant in May. *Photo: via Brian Walters*

This page: Eighteen A-7D Corsair IIs of three US Air National Guard units deployed to RAF Wittering during July for a European familiarisation visit: 12 of the aircraft came from the 169th TFG, South Carolina Air Guard; three from the 112th TFG, Pennsylvania Air Guard; and three from the 121st TFG, Ohio Air Guard. Shown here are some of the 169th TFG Corsairs — two climbing out from Wittering after take-off, and the deployment commander's aircraft 73-1015 with, inset, a close up of the 'War Eagle' emblem aft of the cockpit. *Photos: P. A. Rowlings*







airscan

Paul Humphreys

TWO DOWN AND two more to go! That's the success rating for the Humphreys plan, proposed nine months ago, for the future of British Aerospace, British Airways, Rolls-Royce *et al.*

For those who have just tuned in to the *Airscan* frequency, perhaps a little clarification is necessary at this point. Way back before last Christmas, when the pressing subject of the day was the future equipment of BA and the prospects of BAe, Rolls-Royce and the rest of Britain's aerospace industry. Now before you start rushing off to find your bound copies of *Aircraft Illustrated*, the words in that column were, in essence, that the Government could do far worse than decide to '...build the HS146 as a Viscount replacement... while the urgent need for a Trident and BAC 1-11 replacement is met by buying one of the proven US types. The fact that BA already operates Boeing 707s and 747s points to the 737 as a logical choice for this latter task'.

For your easy reference, the two other suggestions to the NEB and all other interested and participating authorities, was that BAe should join in a JET 1 production programme and grab a piece of the A300.B10 — and as big a piece as possible. Now may I make one more suggestion? If it comes to a choice of getting into bed with either Boeing or McDonnell Douglas, it seems that the better bed-fellow would be McD with the wholly-new ATMR which can use RB211-535 engines. The McD 'package' also includes joint work on projects like the AV-8B and marketing of the HS146.

Incidentally, that's the last time this column will refer to that four-jet feeder-liner to be built at Hatfield as the HS146. In future it'll be BAe146. *Sic transit gloria de Havillandiensis.*

Trans-Atlantic marketplace

With the Farnborough extravaganza in mind, have you thought lately about the growing opportunities for UK and European products and skills in the US marketplace? You should, because HMG is going to need advice — or a good shove in the back — on that subject fairly soon.

NATO has been a pretty successful alliance, but its continuance demands a strong stable economy among its member countries. Last year the UK spent a higher proportion of its defence budget on major new equipment for its NATO forces than any other member; and Britain is the only European nation to contribute to NATO's Triad — the strategic nuclear, theatre nuclear, and conventional deterrent capability. Britain's NATO commitments are a major burden on the economy, but one way to ease it is to get more financial return on our investment of men and machines in NATO.

Standardisation of equipment has been put forward as essential if NATO's operational and logistic efficiency is to be improved and maintained. This is the main requirement, but Britain's defence industry, which produces the means to achieve this efficiency, must get a bigger slice of NATO spending if the economic burden is to be reduced. Standardisation of equipment in NATO can cut costs, but this does not mean a broader NATO market for US products, nor does it infer more participation by European sub-contractors in US production programmes. These are some of the recent proposals — from the USofA, of course.

The first requirement for successful implementation of a NATO standardisation policy through collaborative programmes is the correct attitude of mind by all the parties concerned. At the moment, only Europe has the will, experience and correct cerebral approach to make these programmes work. The US has less experience of multi-national programmes, compared to European creation of complex products like Concorde, Jaguar, Tornado, Martel, Geos, Adour or RB199. In Britain and Europe collaboration means full partnership on a project, from the moment of its inception until the in-service phase is reached.

So often the phrase 'two-way street' has been used to describe possible collaborative arrangements between the US and Europe. In Britain two-way streets carry the same kind of traffic in each direction and this is the kind of technology interchange essential to any trans-Atlantic co-operative deal. Producing US designs in Britain or Europe, with or without fiscal offset, simply is not on.

On this side of the pond we don't regard the production of F-16s in Europe as project sharing. It's okay for the US industry and economy but few equal financial rewards are coming along the eastbound carriageway of the two-way street to Europe.

And what traffic can Britain despatch westbound on this street? With more than half of Europe's aerospace workforce plus unparalleled technical know-how, the UK can offer products and systems equal to, and often superior to their US counterparts. Our V/STOL and advanced engine technology, HUDs, flight simulators and control systems have no equal — and there are many other fields in which Britain is paramount.

A Memorandum of Understanding signed by the UK and the USA last year can help Britain's efforts to sell to the US defence industry. This, and a genuine need for the US to tap a new source of advanced technology, adds great power to our elbow.

If standardisation of NATO equipment is essential it can be achieved through truly collaborative production programmes. In this way NATO's member countries will benefit militarily and will stand to benefit economically through a better share-out of the production work. This is something which we cannot afford to ignore — in the same way that we cannot overlook the rapid build-up of Warsaw Pact forces. If NATO is to remain a credible deterrent force, the military and economic health of its members must be maintained.

One in, one out

Whatever we in Britain may think of the Farnborough Exhibition and Display, this year at least it is reported that there will be a dearth of US hardware, and it is understood that there will be few US military aircraft on show at our premier aerospace and defence exhibition. The strange thing about this absence is that it appears to relate only to Farnborough and not to other major exhibitions around the world. However, at the time of writing, one US aircraft which will excite some attention and is scheduled to participate is Specialized Aircraft's Tri Turbo-3 intended for maritime patrol and rescue duties. Call it what you will, it's still a Dakota/C-47/DC-3 to the majority of us aerophiles.

But if the US is not taking part at Farnborough there's at least one interesting newcomer — Japan. It may come as something of a surprise to learn that, for the first time, the SJAC (Society of Japanese Aerospace Companies) will, be at the SBAC (ditto British ditto ditto) Show. The emphasis looks like being on civil aircraft and engines, but this touch of the orientals will surely add to the interest of this occidental exhibition.

Erratum

Apologies to Capt John Bradshaw and all our readers for the 'apprentice' recognition spot on the centre-spread of the August issue of *Aircraft Illustrated*. The aircraft in the lower right picture was, of course, a Provost. *Ed.*

airnews

Farnborough International '78

This year's Farnborough Show takes place between 3-10 September: Sunday 3 September is the Press Preview Day, the Trade Days (during which admission is reserved for industry, Service and official visitors) are Monday to Thursday 4-7 September inclusive, and the Public Days are Friday to Sunday 8-10 September. The Show is open between 10.00hrs-18.00hrs on the Trade Days and between 09.30hrs-19.00hrs on the Public Days.

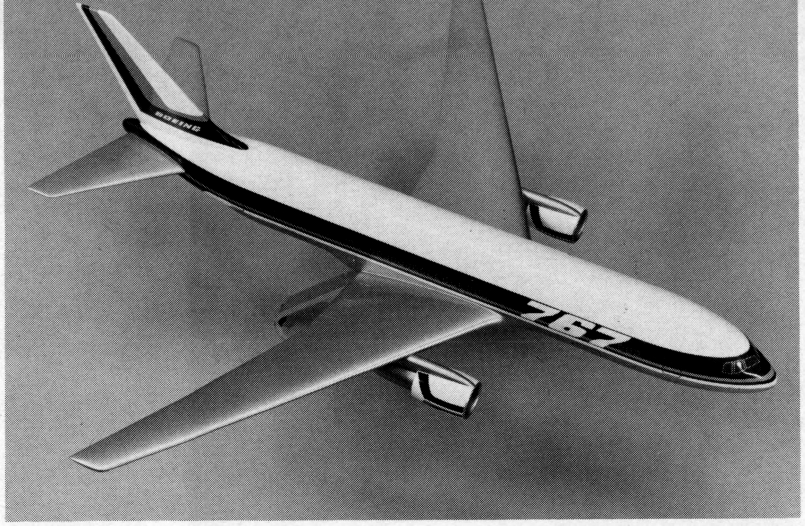
Over 400 companies from 17 countries will be represented at the Show, and there has been a major increase in the indoor and outdoor display areas to accommodate the increased number of exhibitions. The daily flying programme will run for some 2½hr on Trade Days with the addition of extra features on the Public Days, and display entries have been notified or promised by 16 countries including Romania, Poland, Brazil, Argentina, the US and Australia. The USSR has indicated it will be presenting at least one civil aircraft.

Among the types expected to participate in the Show are the BAC One-Eleven srs 670, Sea King HAR3, Hawk, Sea Harrier, Ducted propulsor Islander, Hunter T8M, Jaguar, and AEW Comet from the UK; the A-10A Thunderbolt II, CH-47C Chinook, Learjet 28/29 ('winglets'-version), Turbo AgCat, Hughes-500MD, Tri Turbo-3 (DC-3) and PA38 Tomahawk from the USA; the G222 and MB339 from Italy; C-101 Aviojet from Spain; Mirage F1 and 2000 from France; the Bandeirante and Xingu from Brazil; the IA-58 Pucara from Argentina; the DHC Dash-7, -5D Buffalo and Turbo Otter from Canada; and 'international' designs such as the Tornado, Alpha Jet, A300, and F28.

Britten-Norman to be taken over by Pilatus

The Receiver of Britten-Norman accepted in late-July a letter of offer related to the take-over of the activities of Britten-Norman (Bembridge) Ltd by the Swiss firm Pilatus Aircraft, a member of the Oerlikon-Bühle Group. The letter foresees that Pilatus Aircraft Ltd shall purchase all the assets of Britten-Norman (Bembridge) Ltd, which include the BN facilities on the Isle of Wight and the complete Islander/Trislander production hardware (jigs and tools plus stock materials) which is presently located at the Fairey SA factory in Gosselies, Belgium. Under the terms of the envisaged formal purchase contract Pilatus will acquire the exclusive production and marketing rights for all BN-products. Part and license production of Islander aircraft is planned to continue in Romania and the Philippines under new agreements.

With this planned expansion in the field of multi-engined STOL-aircraft Pilatus would be enabled to offer a complete family of utility aircraft, ranging from the single-engined Pilatus PC-6 Turbo Porter through the twin-engined Islander up to the three-engined Trislander. As part of an action programme to improve sales prospects in the immediate future, plans are in hand for a widely improved version of the Islander — called the BN2-B Islander II, with increased landing weight, better soundproofing, a new instrument panel and a large number of customer-oriented new features — and feasibility studies for new developments of the BN-aircraft line, including a new Turbo-Islander and further derivative models.



Above: Model of the Boeing 767 wide-body airliner. The type was launched into full scale development following an order by United Airlines. *Photo: Boeing*

United Airlines order launches Boeing 767

The Boeing 767 programme was launched into full scale development and production in July following an order by United Airlines for 30 of the new twin-jet airliners valued at $1.2 billion. At the same time, United Airlines also announced orders for 30 B-727s for delivery in 1979 and 1980, and the total order — valued at approximately $1.6 billion — is the largest single order in commercial aviation history.

Deliveries of the 197-passenger B767 from the production line at Everett, Washington are scheduled to begin in mid-1982. The aircraft will be powered by two Pratt & Whitney JT9D-7R engines, each rated at 44,300lb maximum thrust.

Go-ahead for BAe 146

British Aerospace was authorised by the UK Government on 10 July to proceed to full production of the BAe 146 airliner — the long-standing ex-Hawker Siddeley feeder-liner project to be powered by four turbofan engines.

Since the programme was temporarily halted in 1974, work continued to progress and refine the design in light of up-to-the-minute technology and much work in preparation for production had also been undertaken. Major assembly jigs had been constructed and test work on systems rigs was already well advanced by the time of the go-ahead.

Designed to provide greater profitability over short stages, the BAe 146 will achieve substantially lower seat mile costs than the twin turboprop airliners it has been developed to replace. It will also offer greatly reduced aircraft operating costs compared with the larger twin turbojets now in widespread use on mainline routes. An estimated world market requirement for some 1,200 feeder-liners is foreseen by BAe in the next 10-12 years and the Corporation is confident that the '146' will capture a major share of the market.

The aircraft will be offered in two versions. The BAe 146-100 which will seat 70-90 passengers and be able to operate from runways less than 3500ft (1070m) in length with exceptional performance capabilities from high altitude, high temperature airfields — it will be able to operate from both un-paved and low bearing strength runways — and the BAe 146-200, with a longer fuselage and increased design weights which will seat 80-109 passengers and be able to operate from runways less than 4000ft (1220m) long.

Each model will be able to carry its standard passenger payload over stages of up to 1,300nm (2400km) and offer outstandingly quiet operations which will more than meet the latest proposed FAR

Part 36 requirements and the ICAO CAN5 recommendations.

The BAe 146 will be powered by four Avco Lycoming ALF 502-H engines. These small, modular high by-pass ratio fan jets of 6,700lb thrust will contribute to the aircraft's very low noise levels, high fuel efficiency and economy of operation on short haul feeder jet operations.

The design is also readily adaptable to other duties and, in particular, it is intended to develop a military tactical freighter incorporating a loading ramp in the rear fuselage. In this configuration a wide range of military personnel and equipment can be carried, operating from short, rough airfields and the aircraft will have excellent aerial delivery capabilities.

Production will be undertaken in a number of British Aerospace factories as well as in the factories of some major international aircraft manufacturers. Final assembly will be at British Aerospace's Hatfield plant where the marketing operation will also be centred.

BA orders Boeing 737s

Also on 10 July 1978, British Government approval was given to BA's proposal to purchase 19 Boeing 737-200 aircraft. Incorporating many new technological improvements the first aircraft for the BA fleet will be delivered by late-1979 and will be used initially for pilot training. Delivery of the remaining 18 B737s will take place by the end of 1980 and eventually the aircraft will represent a quarter of BAs short haul fleet, replacing Trident I and Trident II airliners.

Special features in the BA Boeing 737s will include: a Performance Data Computer System (PDCS); an automatic engine-throttle control system; a dual channel autopilot; and a Head-Up Display (HUD) or Visual Approach Monitor (VAM) system.

Top awards for RAF Vulcans . . .

Competing against B-52 bombers of USAF Strategic Air Command (SAC) Vulcan bombers from RAF Scampton and RAF Waddington won the two top awards open to both air forces in the 1978 Strike Command Bombing and Navigation Competition, namely the *Blue Steel Trophy* for the air force providing the crew with the best score in bombing, and the *Camrose Trophy* for the best nominated team in bombing.

. . . and Strike Command & RAFG Jaguars on target

The results of the 1978 Strike Command Tactical Bombing Competition, held at RAF Lossiemouth between 1-10 July, reversed many of the placings achieved in last years competition (see *Aircraft Illustrated*, December 77, pages 486 and 487). The contest, designed to test the ability of aircrews to perform their wartime tasks under very demanding conditions, was between the 23rd TFW, USAF Tactical Air Command (TAC), England AFB, La — whose A-7D Corsairs won most of the major 1977 trophies, and teams of RAF Jaguars from Coltishall and Bruggen, and Buccaneers from Honington and Laarbruch.

Although the principal award, the *Sir John Mogg Trophy*, was won again by the 23rd TFW — with Jaguars from Coltishall taking 2nd and 4th places — the RAF won the remainder of open trophies. The *BAC Trophy* for the best leadership in bombing and navigation was won by Sqn Ldr Russ Peart of No 6 Squadron, Coltishall, and the *Weapons Trophy* for the best individual bombing score was awarded to Flg Off Gary Rogers of No 31 Squadron who achieved a remarkable score with 8 out of 12 bombs falling within 12ft of the target. The *Top Gun Trophy* for the best individual strafing score went to Flt Lt John Hodson of No 6 Squadron and the Coltishall Jaguar team won both the *Marconi Elliot Trophy* (best RAF team) and the *Ardour Trophy* (best Jaguar team).

BAe receives more orders for Airbus wings

New orders worth over £20 million have been placed on British Aerospace's Hatfield-Chester Division by Airbus Industrie — the European consortium which controls the production of the Airbus A300. These orders cover the completion of a further 16 sets of wings together with authority to purchase wing materials up to aircraft No 148. Already 80 sets of wings have been delivered to Europe for completion in Bremen and final assembly in Toulouse.

The additional orders for A300 wing sets reflects recent marketing successes with the aircraft, sales of which have more than doubled during the past year. By early-July Airbus Industrie held 99 firm orders and 43 options from 14 major airlines. Fifty three aircraft had been delivered and production, which will be at two per month in November, is planned to increase to three per month during 1979.

Westland Commandos for the Royal Marines

An order for 15 Westland Commando troop transport and logistic support helicopters for the Royal Marines has been received by Westland Helicopters.

The order placed by the Ministry of Defence is the first UK order for the Commando, a Westland development of the successful Sea King which is operated by the Royal Navy and Royal Air Force and seven Defence forces overseas. Westland Commandos are already in service in the Middle East.

The Royal Marines version which will enter service at the end of 1979 will carry 20 fully equipped troops or 6,000lb of cargo, and will be able to operate in arctic and tropical conditions.

The Commando — powered by two Rolls-Royce Gnome H1400-1 turbine engines — will operate from ships of the Royal Navy and will have folding main rotor blades and tail rotor.

airnotes

A new order for 48 Mirage F1s by the Spanish Government has brought total orders for the type to 508. The French Air Force is taking 185 of these and the rest are for South Africa, Spain, Kuwait, Greece, Libya, Morocco, Iraq and Equador.

●

In late-June 1978 the P-68B 'Observer' surveillance aircraft was used for the first time for police operations in the Federal Republic of Germany. The 'Observer' has been developed by Sportavia Pützer — an affiliate of Rhein-Flugzeugbau GmbH forming part of the VFW-Fokker group — from the Italian Partenavia P-68B 'Victor' twin-engined business and executive aircraft.

Japan has decided to purchase 45 Lockheed P-3C Orions to replace its existing ASW Neptunes. Japan will be the eighth country to operate the P-3 of which nearly 500 have now been built. The order is worth $250 million to Lockheed.

A contract has also been signed by Japan covering the purchase of 100 McDonnell Douglas F-15 Eagles. The F-15s, like the P-3Cs, will be built under license in Japan.

●

Nine more OV-10 Bronco forward air control aircraft have been assigned to the 601st TCW at Sembach AB, Germany, as part of a continuing programme to up-grade the combat readiness of USAF units based in West Europe.

Two RAF Jaguars of No 54 Squadron crossed the Atlantic on 14 July 1978 to commemorate the 30th anniversary (to the day) of the first-ever jet crossing of the Atlantic in 1948 by six Vampires of the same squadron. The Jaguars took-off from their base at Coltishall and, after being refuelled in mid-Atlantic by Victor tankers of No 57 Squadron, landed at Goose Bay, 2,260 miles away.

●

The annual NATO 'Autumn Forge' series of exercises began this month and will end in November 1978. This is the fourth successive year for the Allied Command Europe (ACE) exercise series: their central purposes are to improve and demonstrate ACE solidarity and defensive

preparedness; to refine command and control procedures to respond to a military crisis situation; and to work towards better uniformity of doctrine, procedures, and logistical support. As part of the series, this year's USAF 'Crested Cap' exercise will feature the deployment to Europe of two squadrons of F-4E Phantoms from the 4th TFW at Seymour Johnson AFB, NC.

●

The maiden flight of the first production Alpha-Jet for the Belgian Air Force took place on 20 June 1978 at Toulouse-Colomiers. The aircraft — one of 33 ordered by Belgium — was assembled at the Dassault-Breguet Toulouse-Colomiers plant but the remainder will be produced by SABCA at Gosselies, Belgium.

●

Believed to be one of the biggest inter-airline co-operation schemes formulated to date, British Caledonian and Sabena Belgian World Airlines concluded in June the first phase of a major agreement for world-wide commercial and marketing co-operation on selected inter-continental routes. The first phase will allow B.CAL to promote and sell in the UK a range of key Sabena routes and likewise Sabena will integrate certain B.CAL services into its sales and reservations system. This phase of the co-operation pact began on 1 July 1978 and will operate to 31 March 1979.

●

Concorde 213, assembled at the Aerospatiale Toulouse plant, successfully completed its maiden flight on 26 June 1978. The flight lasted 4hr 14min and included a sector at Mach 2. The aircraft's first flight follows that of the British Aerospace-assembled Concorde 214 (see *Aircraft Illustrated*, July, page 357) with the two final production examples 215 (France) and 216 (Britain) yet to fly.

●

On 15 August Braniff International inaugurated extensions to its US/Mexico City service with through-plane services now proceeding onwards to the three South American cities of Bogota, Colombia; Guayaquil, Equador; and Lima, Peru. Operated by Boeing 727-200s, three flights per week leave Minneapolis and St Paul and arrive at Mexico City via Dallas-Fort Worth. One flight goes on to Guayaquil and then to Lima, another proceeds to Bogota and Lima and the third serves Guayaquil via Bogota.

●

Over one billion passengers have now travelled on the DC-9 airliner since the type's service introduction in 1965. Every day some 339,000 DC-9 passengers are being carried by a total of over 6,000 flights to some 560 cities world-wide, and McDonnell Douglas' computers calculated that the billionth passenger stepped aboard one of these services on 20 July.

Airliner Orders and Deliveries

Airline	*Aircraft*	*No*	*Ordered*	*Delivery Date*	*Notes*
Aer Lingus	Boeing 737-200	2	June 1978	April and June 1979	These aircraft are the 10th and 11th B737s ordered by the airline.
Aeromech	DHC Twin Otter	1	n.d.	July 1978	The aircraft delivered to Aeromech was the 600th Twin Otter manufactured by de Havilland Canada. Aeromech — a member of the Allegheny Commuter system — fly two Twin Otters on scheduled services between points in West Virginia, Pittsburgh and Washington.
Air India	Boeing 747-200B	1	July 1978	August 1979	Air India presently operates six B747s: the type was introduced on the airline's long-haul routes in March 1971.
Air Wisconsin	Swearingen Metro II	2	June 1978	1978 and 1979	Delivery of these aircraft will increase Air Wisconsin's Metro II fleet to 14.
All Nippon Airways	Boeing 747SR	4-firm	27 June 78	Sept 1979-Feb 1980	The four B747SRs (Short Range) on order are scheduled for delivery in September and October 1979, and January and February 1980. The B737-200s — intended to replace six older aircraft of the same type — will be delivered in July(2), August, November, and December (2)1979. Purchase of the aircraft is valued at more than $240 million.
		4-options	27 June 78	1981	
	Boeing 737-200	6	27 June 78	Jul-Dec 1979	
Aviaco	DC-9CF	4	17 July 78	late-1979	Aviaco (Aviation Y Commercio SA) will operate the extended range DC-9s on charter flights between the Canary Islands and Europe.
Britt Airlines	Swearingen Metro II	1	12 July 78	n.d.	Britt Airlines, part of the Allegheny Commuter system, will initially operate the Metro II between Terre Haute, Ind. and Danville and Chicago, Ill.
Dyrberg Aviation	Swearingen Metro II	1	n.d.	16 June 78	Dyrberg Aviation of Copenhagen has become the first Scandinavian airline to operate the Metro which will fulfil the demand for medium- to long-range pressurised transportation between Denmark, Faroe Islands, Iceland and Greenland.
Linhas Aereas Da Guiné Bissau	HS748	1	14 June 78	late-1978	The HS748, ordered from BAe by the Government of Guiné Bissau, is to aid the development of the new state airline — Linhas Aereas Da Guiné, Bissau — in opening up domestic routes and operating external services to neighbouring countries.
Lufthansa	Airbus A300.B10	10-prelim	6 July 78	commencing late-1982	A preliminary contract has been signed between Lufthansa and Airbus Industrie in the form of a 'Memorandum of Understanding', covering the planned purchase of the new Airbus B10 variant. A final purchase agreement is expected to be signed by late March 1979. The A300.B10 will have a shorter fuselage than earlier models of the Airbus and a newly developed, smaller wing.
		15-options	6 July 78		
Olympic Airways	Airbus A300.B4	2	10 June 78	Jan and Feb 1979	This is confirmation of the two orders for A300.B4s signed by Olympic Airways in a Letter of Intent in March 1978. The airline still retains options on a further three aircraft (see *Aircraft Illustrated*, June 1978, page 268).
Suburban Airlines	Shorts 330	2	30 June 78	late-1978 and mid-1979	The sale to Suburban raises total orders for the Shorts 330 to 28 which includes 24 firm sales. Suburban is ranked 15th largest out of 250 US commuter airlines.
Swissair	Airbus A300.B10	6-prelim	6 July 78	n.d.	A 'Memorandum of Understanding' has been drawn up between Airbus Industrie and Swissair concerning the A300.B10. Swissair has indicated its interest 'in principle' in an initial purchase of six B10s, but a definite order will only be placed after all the contract conditions have been negotiated and agreement has been reached on the design and performance specifications of the new aircraft.
Tavina	Swearingen Metro II	1	27 Jan 78	18 July 78	This was the first delivery of two Metro IIs ordered by the airline (see *Aircraft Illustrated*, April 1978, page 164). The second aircraft is expected to be delivered by the end of this year.
Thai Airways	Boeing 737-200	1	6 July 78	Oct 1979	This order follows the success of the carriers first B737 — delivered in October 1977 — on the daily Bangkok-Chiang Mai route.
Votec, Brazil	Sikorsky S-61N	2	27 June 78	Sept and Oct 1978	The helicopters purchased by Votec (Servicos Aereos Regionalis) will be used to support offshore oil operations and will be joining the operators first S-61N which entered service in December 1977.
United Airlines	Boeing 767	30	14 July 78	mid-1982	On the strength of United Airlines order, Boeing has launched the '767' programme into full scale development and production (see *Airnews* item). The total order placed by United Airlines is valued at more than $1.6 billion and represents the largest single transaction in commercial aviation history.
	Boeing 727-200	30	14 July 78	1979 and 1980	
British Airways	Boeing 737-200	19	10 July 78	late-1979-1980	See *Airnews* item.

n.d. = no details

airregister

Compiled by A. J. Wright

ANOTHER PAIR OF DC-3s from Spain appear in the columns this month. Both are quite early production machines, G-BFXA being an ex-C-53 of the USAAF while its partner started life in 1942 as a R4D-1 with the US Navy.

A couple of the allocations listed have already been cancelled. The Dan-Air HS748 has not been imported, therefore G-BFUA may well be reallocated. Similarly G-BFVN was not adopted by the HS125, the out-of-sequence marks of G-EFPT being preferred.

For the record, the Laker DC-10s recorded last month have reversed their construction numbers G-GFAL is 46970 and G-GSKY is now 46973. Jet Ranger G-CPTS is now known to have c/n 8556.

Registration	Type	C/n	Owner or operator
G-BFLM	Cessna 150M	76352	J. E. W. Price (N3017V)
G-BFLN	Cessna 150M	76416	Bournair Ltd (N3198V)
G-BFNM	Globe GC-1B Swift	2205	F. D. Ockelford (N78205)
G-BFSJ	W-Bell 47G-3B1	WAP146	R. K. Bradshaw (XT543)
G-BFTO	Scorpion 133	2593	Rotorway Helicopters Ltd
G-BFUA	HS748 srs 2	1599	Dan-Air Services Ltd (XA-SEY)
G-BFUW	Bulldog 120 Model 123	394	BAe Scottish Division
G-BFUX	Bulldog 120 Model 123	395	BAe Scottish Division
G-BFUY	Bulldog 120 Model 123	396	BAe Scottish Division
G-BFVC	Thunder AX-7-772 balloon	100	Thunder Balloons Ltd
G-BFVD	*Not to be allocated*		
G-BFVE	Bell 212	30698	British Executive Air Services Ltd (C-GOKY)
G-BFVJ	Bulldog 120 Model 123	397	BAe Scottish Division
G-BFVK	Bulldog 120 Model 123	398	BAe Scottish Division
G-BFVL	Bulldog 120 Model 123	399	BAe Scottish Division
G-BFVM	W-Bell 47G-3B1	—	Heliwork Ltd (XT234)
G-BFVN	HS125 srs 700B	257020	Finamet Ltd
G-BFVO	*Not yet allocated*		
G-BFVP	*Not yet allocated*		
G-BFVR	HS748 srs 2A	1760	BAe Manchester Division
G-BFVS	*Not yet allocated*		
G-BFVT	Argosy C1	6798	Via Nova International Ltd (XR143)
G-BFVU	*Not yet allocated*		
G-BFVV	SA365 Dauphin 2	5011	Management Aviation Ltd
G-BFVW	SA365 Dauphin 2	5014	Management Aviation Ltd
G-BFVX	Beechcraft C90 King Air	LJ-803	Vernair Transport Services
G-BFVY	Beechcraft C90 King Air	LJ-812	Vernair Transport Services
G-BFVZ	*Not yet allocated*		
G-BFWA	*Not yet allocated*		
G-BFWB	PA-28-161 Warrior II	7816584	CSE Aircraft Services Ltd (N3175Z)
G-BFWC	*Not to be allocated*		
G-BFWD	Currie Wot	3009	F. E. Nuthall
G-BFWE to G-BFWI	*Not yet allocated*		
G-BFWJ	T-65A Vega	1887	Vickers Ltd
G-BFWK	PA-28-161 Warrior II	7816610	Woodgate Aviation Ltd
G-BFWL	*Not yet allocated*		
G-BFWM	*Not yet allocated*		
G-BFWN	*Not yet allocated*		
G-BFWO	Bulldog 120 Model 123	400	BAe Scottish Division
G-BFWP	Bulldog 120 Model 123	401	BAe Scottish Division
G-BFWR	Bulldog 120 Model 123	402	BAe Scottish Division
G-BFWS	Bulldog 120 Model 123	403	BAe Scottish Division
G-BFWT	Bulldog 120 Model 123	404	BAe Scottish Division
G-BFWU	Bulldog 120 Model 123	405	BAe Scottish Division
G-BFWV to G-BFWZ	*Not yet allocated*		
G-BFXA	DC-3	4890	Fairoaks Aviation Services Ltd (T3-58 Sp.A.F/EC-ABQ/EC-DAL/ N44884/41-20120)
G-BFXB	DC-3	4225	Fairoaks Aviation Services Ltd (T3-42 Sp.A.F/N57V/N95487/ 3135 US Navy)
G-BGAL	S-330 Firefly balloon	8	A. M. Lindsay
G-BGAS	Colting AX8-105A balloon	001	British Gas Corporation
G-BGFL	PA-31-350 Navajo	7752047	Ron Webster (Midlands) Ltd (N63728)
G-BGMJ	GY201 Minicab	12	J. R. Ramshaw (F-BGMJ)
G-BGPI	BGP-1 Biplane	83-10359	B. G. Plumb
G-BINO	Evans VP-1	3642/9	J. I. Visser
G-BMYU	Jodel D120	289	G. H. Wilde (F-BMYU)
G-BNJF	PA-32RT-300 Lance III	7885098	Fromest & Co. Ltd (N31539)
G-BPAM	Jodel D150A	02	M. Hughes and P. D. Yapp (F-BLDA/ F-WLDA)
G-BRAC	Britannia 253F	13448	Redcoat Air Cargo Ltd (EI-BDC/XL639)
G-BRMA	Dragonfly Mk5	WA/H/150	E. D. ap Rees (WG719)
G-BRMB	Belvedere Mk1	13347	E. D. ap Rees (XG452)
G-BSTN	PA-31-350 Navajo	7852069	Airmore International Ltd (N27589)
G-CDBI	PA-23-250 Aztec	7305193	Northern Executive Aviation Ltd (N40475)
G-DEBI	Beech E36 Bonanza	E-674	R. J. Higgins (TR-LUH)
G-EFPT	HS125 srs 700B	257020	Finamet Ltd (G-BFVN)
G-EURO	Cessna 310R	0579	Ron Webster (Midlands) Ltd (N87468)
G-FCAS	PA-23-250 Aztec	7854086	Firmin Coates & Sons Ltd (N63962)
G-GEAR	Cessna FR182	004	Northair Aviation Ltd
G-HAPR	Sycamore Mk4	13387	E. D. ap Rees (XG547)
G-HELI	Skeeter Mk12	S2/5110	E. D. ap Rees (XM556)
G-HENK	Cameron V-77 balloon	423	Cameron Balloons Ltd
G-IKIS	Cessna 210H	61754	Rogers Aviation Ltd
G-JAMS	Cameron O-31 balloon	424	N. A. Robertson
G-JBUS	Clutton FRED II	29-10396	R. V. Joyce
G-KACT	Cessna 421B	0368	M. J. Collins (OY-RPL)
G-PAUL	Partenavia P68B	147	DK Aviation Ltd
G-PINK	Cameron N-77 balloon	399	Leaveglen Ltd
G-RHHT	PA-32RT-300 Lance III	7885190	H.T. Air Freight Ltd (N36476)
G-STIO	ST-10 Diplomate	125	Rogers Aviation Ltd (OH-SAB)
G-THOR	Thunder AX8-105 balloon	150	Thunder Balloons Ltd
G-ZEPP	Cameron D-96 Airship	361	Leaveglen Ltd

airmail

Airport protests

Sir,

In July's *Airscan*, Paul Humphreys asks us to spare a thought for Shigeru Otsuka, President of Tokyo's Narita Airport Authority. He compares the violent demonstrations at Narita with the protestations over Wing and Maplin, 'wordy battles... long gone and forgotten by the great majority of people'. Could we not rather spare a thought for the Stansted protesters, even longer ago and forgotten?

It was the success of the anti-Stansted campaign that led to the Roskill Commission, and its choice of Wing, later to be rejected in favour of Maplin, itself to be ultimately rejected. And now Stansted is to expand anyway — an airport, it will be remembered, originally chosen for expansion in 1949, and consistently assumed to be the likely site of the next London airport from the mid-1950s, largely because it was one of the few places at that time with a decent runway. Despite this long 'pedigree', the protesters won their case and their victory was vindicated when Stansted was not even short-listed by Roskill. All that is now conveniently forgotten.

Memories being so short, I would hesitate to join Paul Humphries in calling the Wing and Maplin protestations successes, such is the apparent amorality of today's planning processes.

B. J. COX
Fenstanton, Cambridgeshire

P-51 Association

SAC Paul Coggan has written to advise that he is endeavouring to form an International Association of P-51 Mustang Historians and Enthusiasts. Anyone interested in joining should contact him at: 11 Halton Road, RAF Watton, Thetford, Norfolk IP25 6JN.

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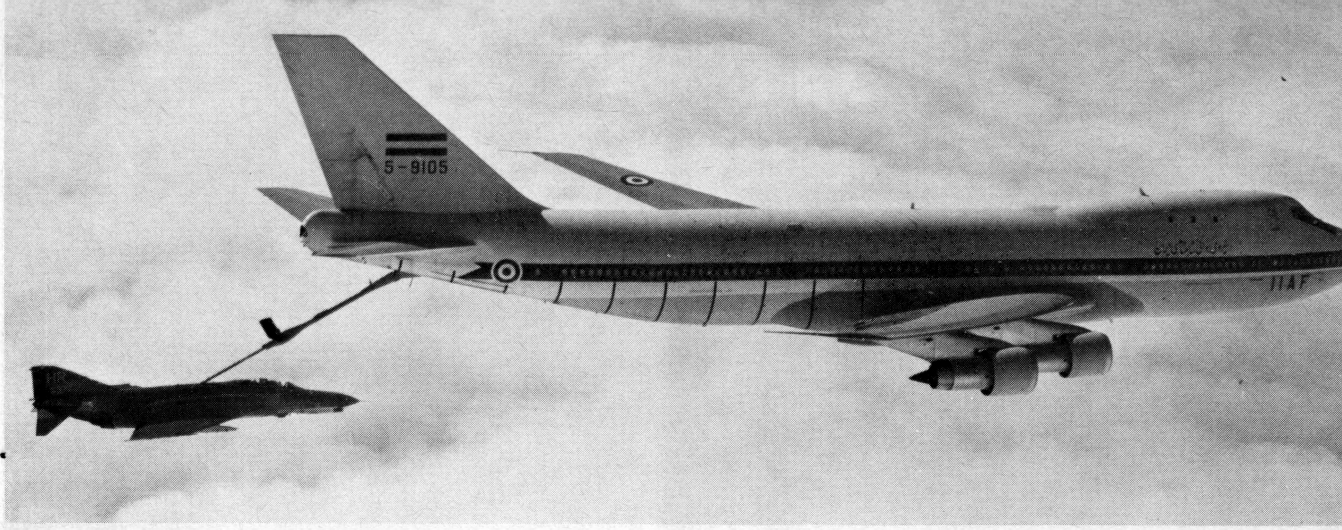
Units of USAFE: No 4

HAHN can 'hack' it!

The Editor *reports on the 50th TFW and its recent readiness exercise, 'Salty Rooster'*

THERE IS AN old aviation adage which asserts that 'the more aircraft fly, the better they fly'. It is a proposition which could equally well apply to the aircrews concerned, and it is likely to have beneficial implications also for the entire ground support organisation which keeps them flying. One USAFE unit which is particularly well qualified to assess the significance of the saying is the 50th Tactical Fighter Wing at Hahn Air Base, Germany, which operates



Above: An F-4E of the 496th TFS/50th TFW refuelling from an Imperial Iranian Air Force Boeing 747 during the deployment to Iran for Exercise 'Midlink '77'. *USAF Photo by 1Lt Rich Wilson*

Left: Maverick-armed Phantom taxying past the control tower at Hahn; note the large-scale version of the 50th TFW badge on the front of the tower.

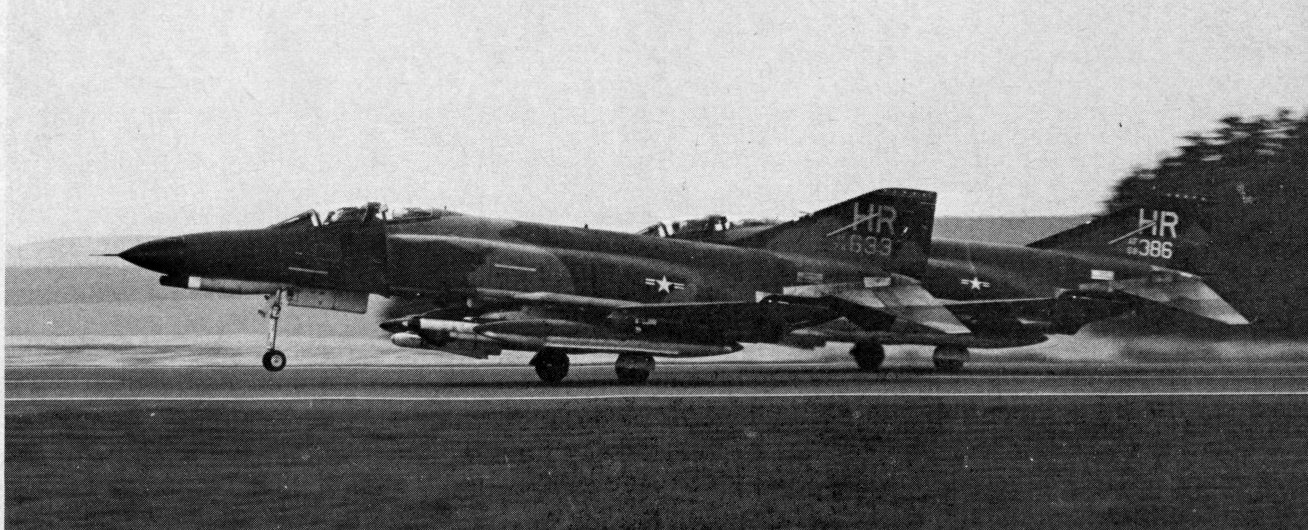
Below left: A mural inside Wing HQ also features the unit's badge and those of its current and former squadrons.

Below: Two F-4Es about to lift-off on another training sortie from Hahn.
Photos: The Editor

three squadrons of F-4E Phantoms. Earlier this year, the Wing was tasked to implement one of the most ambitious readiness exercises ever undertaken in USAFE and, indeed, in the USAF as a whole.

Code-named 'Salty Rooster' — the name itself providing a foretaste of the degree to which the evaluation was going to call for a nimble-witted response from the Wing (*Hahn* in German means a rooster), the exercise was to be the conclusive test of a new maintenance system introduced at Hahn in January 1977. For the 50th TFW, 'Salty Rooster' was to represent a major challenge at the end of a year which had already put their 'can do' approach very much to the test. The Wing had become accustomed to being volunteered for 'Can you do.....'-type assignments, and responding with a 'We can do anything!'-type attitude. So here was another chance to demonstrate the point in what was already being billed as 'the exercise of the '70s'.

The USAF, like other allied air forces, has long recognised that its day-to-day, routine training in peacetime cannot provide an adequate measure of the full operational capability which would be required in wartime. So assessments of the readiness of units to fulfil their wartime tasks are conducted during special tests which pitch the intensity of training activity way beyond the normal peacetime level. These tests are exemplified by the USAF's no-notice Operational Readiness Inspections (ORIs) and, specifically in Europe, by the similar NATO Tactical Evaluations (Tacevals). Such inspections provide a simulated wartime scenario as the starting point for a thorough examination of the unit's preparedness to conduct full-scale operations. Also much in vogue recently have been the so-called 'sortie surge' exercises. This latter term is 'airpower-speak' for unit-level operations which, in the Service's vernacular, are designed to 'generate' as many FMC ('fully mission capable') aircraft as possible; to



launch, recover, refuel, re-arm and re-launch them; and to keep up the pre-set tempo of this activity for as long as may be directed.

But the generally short periods over which these exercises and inspections are held — and the fact that sometimes they specialise in demonstrations of aircraft availability for tasking, and mission performance — means that they may not fully test the 'total' capability of the unit concerned, eg its sufficiency of manpower and equipment authorisations, and the capacity of the supply system needed to maintain a much expanded level of operation. 'Salty Rooster' was designed to achieve this more comprehensive evaluation by mounting an exercise of an increased intensity and longer duration than normal. Whereas the usual type of inspection, evaluation, or sortie surge might last for a matter of days, 'Salty Rooster' was scheduled to last for two weeks and to determine just how well the 50th TFW stood up to a thorough and very realistic simulation of its wartime capability.

The background to 'Salty Rooster' was a period of several years during which many changes had taken place at Hahn in terms of the 50th TFW's strength, equipment, organisation and mission, these alterations reflecting the wider force improvements which USAFE has been adopting. For most of this decade, Hahn has been a two squadron base with its facilities structured accordingly, though with some extra capacity by way of accommodation, etc, to support the temporary basing of additional aircraft taking part in the 'Crested Cap' exercises which involve the deployment of units from the US to Europe. Following the re-assignment of the 81st TFS to Zweibrucken in 1971 as the first 'Wild Weasel' squadron in USAFE, the 50th TFW was left with the 10th TFS and the 496th TFS under its command. The 496th was a specialist air defence outfit which only in the previous year, 1970, had relinquished its F-102 Delta Dagger interceptors and been redesignated as a tactical fighter squadron rather than a fighter interceptor squadron. Its new equipment was the F-4E Phantom and although transformed therewith into the 496th TFS from the 496th FIS, the squadron retained its primary air defence mission. The Wing's other squadron, the 10th TFS, flew the F-4D version of the Phantom, and had been so equipped since the mid-1960s.

The present shape of the 50th TFW materialised during 1976 as part of the Phantom re-shuffle in USAFE occasioned by the lead-in to the re-equipment of the 36th TFW at Bitburg with the F-15 Eagle. Instead of withdrawing the Bitburg F-4Es from Europe, USAFE distributed the aircraft to other wings and bases thus significantly upgrading the overall strength of the Command and permitting both the formation of new squadrons and the replacement of earlier Phantom variants by the F-4E. At Hahn these developments resulted in the re-activation of the 313th TFS to operate a newly available squadron of F-4Es, and the issue of F-4Es to the 10th TFS in place of their F-4Ds.

By the beginning of 1977, then, the 50th TFW was a three-squadron Wing, solely equipped with the F-4E Phantom. The presence of an improved interceptor capability at Bitburg in the form of the F-15 Eagle-equipped 36th TFW allowed USAFE to stand down the 496th TFS from its primary air defence duties so that the 50th TFW is now dedicated entirely to a tactical aviation mission. The roles of the Hahn squadrons today encompass tasks such as counter-air attack, interdiction, close air support, and interception, and the Wing maintains a capability to deliver all types of tactical weapons systems which would be needed to undertake its mission. Within USAFE, the 50th TFW forms part of the 17th Air Force, headquartered at Sembach AB, Germany, but in common with the other NATO-assigned forces of the 17th AF, command of the Wing would be transferred to the Alliance's Fourth Allied Tactical Air Force at a time of crisis, and once a certain state of alert has been reached.

The 50th TFW's training programmes regularly take its squadrons considerable distances from their home base, most commonly to the weapons ranges in Spain and Italy when the detachments are based at Zaragoza and Aviano respectively. Aircraft from the Wing have also operated out of Incirlik in Turkey, and have recently made two deployments to Shiraz in Iran. The first of the latter was a range exercise involving the 10th TFS, which took 18 F-4Es to Shiraz for a 10-day stay while the second was a CENTO exercise, 'Midlink '77' in which the 469th TFS participated with a 10-aircraft detachment based at Shiraz for a month.

One of the most important advantages gained during these off-base deployments is that they take the crews away from Hahn's notorious weather and thus facilitate the completion of some uninterrupted mission practice. It is thought that the base is on the receiving end of some of the worst flying weather in Europe — a problem which is compounded by its location atop a 1,650ft-high ridge in the Hunsrück mountains, south of Germany's famous Mosel wine producing region. The airfield actually lies either side of a pre-WW2 strategic highway called the *Hunsrückhohenstrasse* — literally, the high road along the Hound's backbone! The construction of the base was started by the French, in what was their zone of occupation, shortly after the formation of NATO. Negotiations between the French and the US led to the transfer of the site in 1951 and the eventual completion of Hahn AB in the following year, pending the arrival of the 50th Fighter Bomber Wing (as the Wing was then designated) with F-86 Sabres in August 1953. In its current layout the base covers some 1,230 acres with almost an additional 100 acres set aside for housing and quarters. At present there are some 5,000 Service personnel in the Wing — no fewer than 920 of whom last year extended their tour of duty at Hahn, while the total US community (including family dependants) numbers approximately 12,000.

What might be described as the chicken coop for Hahn's 'Salty Rooster', ie, the new framework for the 50th TFW's maintenance organisation which was going to require a detailed evaluation at some stage in the future, first appeared in January 1977. The revised maintenance concept is called the Tactical Aircraft Maintenance System — or TAMS for short. The selection of the 50th TFW to make the first tests of the system in Europe was designed to assist USAFE in deciding

This picture: 50th TFW F-4E Phantom outside its shelter in one of the Hahn dispersal areas. *Photo: The Editor*

whether TAMS will be implemented throughout the Command.

The salient difference between TAMS and the previous 'Air Force 66-1 Manual' maintenance organisation is that it is a so-called production orientated system which lays emphasis on processes leading up to, and the goal of generating fully serviceable aicraft: it embodies reduced distinction between the 'static' tasks of overhaul and repair and the 'dynamic' of producing flyable aircraft. Systems and components are seen less as separate entities and more as part of the aircraft inventory which the Wing's maintenance arm has to keep at the required on-line strength. Reflecting this changed approach, the introduction of TAMS brought with it a completely new maintenance structure. Whereas the 66-1 Manual specifies a four squadron maintenance system — comprising an Organisational Maintenance Squadron (OMS), Field Maintenance Squadron (FMS), Avionics Maintenance Squadron (AMS) and Munitions Maintenance Squadron (MMS) — the TAMS system is based on a three squadron operation consisting of an Aircraft Generation Squadron (AGS), Equipment Maintenance Squadron (EMS) and Component Repairs Squadron (CRS).

So the key to the TAMS concept is the belief that it is a more flexible and adaptable system providing for a better continuity of tactical fighter wing aircraft availability. It was to evaluate this principle — and to determine whether the Wing had sufficient personnel, equipment and supplies — in the context of an advanced state of readiness with a high intensity of aircraft utilisation over an extended duration, that the 'Salty Rooster' exercise was held in April this year.

An ancillary purpose of the exercise was to check the working of announced USAF initiatives to rapidly reinforce NATO and conduct high density flying operations as part of the Alliance's response to any future contingency. One of the objectives of 'Salty Rooster' was that the 50th TFW should receive, integrate and effectively employ the additional personnel needed to permit heavy wartime tasking. The majority of the augmentees, who numbered some 300 in all, were maintenance specialists from USAF Air Training Command in the US, though they were supplemented by temporary duty personnel from elsewhere in USAFE.

On Monday 3 April, a DC-8 flew in the last cadre of personnel for the 'augmented 50th TFW' from the US, and the Wing's orientation programme for the new arrivals moved into top gear. Tuesday was spent on a series of briefings ahead of the exercise but late in the day Wing HQ distributed an instruction to its Battle Staff for the commencement of aircraft generation at 0600hr Zulu on 5 April — the 'Salty Rooster' was about to start crowing.

Wednesday, the first day of the exercise was 'Generation Day' with the 50th EMS assembling and delivering ordinance and the 50th AGS conducting pre-flight checks and preparing the Phantoms for missile loading. FMC aircraft were in fact generated at such a pace during the morning that the Wing passed its 12hr-target inside 6hr! The rest of the week was spent in enhancing still further the readiness of the Wing and flying a number of training sorties for range practice and combat turns (operational turn-rounds). The keynote for this phase of the exercise was the Wing Commander's reminder about the five Ps — *P*rior *P*reparations *P*revent *P*oor *P*erformance, a caution which was timely in ensuring that 'Salty Rooster' would be conducted with a remarkable safety record.

The 'Salty Rooster' flying programme started on 10 April but its wings were clipped by bad weather during the morning. Despite low cloud and poor visibility the sortie schedule got underway and the tempo of operations improved with better weather during the afternoon and into

the night. By the end of the day, the Wing had flown triple its normal number of daily training sorties. The intensity of the flying was reflected by the POL refuelling operation which serviced 267 aircraft on Day One, providing almost 0.4 million galls of fuel via tankers and the 'hot pit' refuelling areas (the latter installations permitting the engine-running replenishment of the F-4Es).

The exercise built-up steadily during the next three days until, by the end of Day Four, an incredible total of 1,060 sorties had been flown — with a total of 297, a new record for the Wing, on the fourth day itself. Many of the individual Phantoms had begun to assemble impressive sortie counts, meeting every scheduled take-off at utilisations in excess of six sorties per day. All this airborne activity was demanding an intensive effort from the ground support team including the Quick Check Crews accomplishing the pre-flight checks at the take-off end of the runway; the 'Cotton Pickers' at the other end who were promptly recovering the drag chutes before the wind had them off the runway into the wet grass or mud; the 50th CRS Parachute Shop which was re-packing, stacking and delivering the braking parachutes to

Top: Quick Check Crews clearing a 'Salty Rooster' mission before the aircraft move out for take-off.

Centre: 'Rooster' recognition up-date as a pick-up truck-mounted version of the exercise 'mascot' drives past a disbelieving Phantom crew.

Left: Close-in view of a rapid operational turn-round during 'Salty Rooster'.
Photos: USAF

Right: Phantom returning from a training sortie moves along the taxiway heading for its own parking 'lot' — a shelter in the wooded dispersal area.
Photo: The Editor

the flight line; the engine maintenance specialists who were effecting the rapid turn-round of aircraft undergoing engine changes; and the 50th EMS munitions specialists who were accomplishing a maximum effort in loading and 'downloading' ordinance.

The bad weather returned on Day Five of 'Salty Rooster', and with snow showers and bad visibility hampering the recovery of returning sorties at Hahn, most of the 17th AF bases became transient 'roosts' for some of the 50th TFW's aircraft. The Wing's new Supervisor of Flying commented that while he had demonstrated his ability to launch the aircraft from Hahn, he needed some additional practice in recovering them there! Operation 'Blue Goose' was organised at the end of the day to get the aircrews back to base, though these were not merely return flights — they were arranged as exercise sorties by the off-base detachments. The Wing was encountering a nicely representative selection of European bad weather by Day Six as the morning started with ice fog over the airfield! This later lifted and the exercise was brought back on schedule. On Day Seven, snow showers were once again drifting across the base and making operations less than straightforward, but it added up to yet another test of the Wing's capability to conduct sorties regardless of unfavourable flying conditions.

In the second week of the exercise the sortie numbers began picking up again with the weather conditions being more consistently above the peacetime minima and the accumulating experience gained during 'Salty Rooster' having an evident influence on the despatch with which things were getting done. Day Ten saw another milestone passed with the 2,000th sortie of the exercise being flown appropriately by one of the 'high time' Phantoms which was on its 49th 'Rooster' sortie, and still going strong.

During this final phase of the exercise the 'Salty Rooster' programme tested the Wing's ability to operate under extra stress situations, and additional scenarios were incorporated to assess the flexibility of the ground operations. For example, the use of the hot pit refuelling bays was ruled out in an endeavour to see how well the fuel servicing could be accomplished using the fuel trucks only. In fact the assignments were covered with sufficient ease that the target requirements were re-set at a higher level the next day in an endeavour to provide an even more demanding test. Another complication introduced for the mission turn-rounds was the recovery of the sorties in a random sequence of combat returns which did not correspond to the order in which the take-offs had occurred.

Meanwhile the live bomb missions on the weapons ranges were proceeding apace, and much to the satisfaction of the munitions load crews who did not have to off-load the stores as had been the case during 'freight only' practice sorties earlier in the exercise.

During the last flying day, Day 13, the weather on the ranges interrupted the final sorties but by then the exercise Steering Committee was able to agree that all the objectives had been met, and 'Salty Rooster' was terminated with a sortie count which totalled 2,771. Some of the aircraft had flown over 60 consecutive sorties without once failing to meet a programmed take-off, thus more than underlining the relevance of the adage mentioned at the outset of this report.

The results of the exercise reflected further distinction for the 50th TFW whose earlier performance had been recognised, for example, by the award of the C-in-C USAFE's Trophy to the Wing's 313th TFS as the 'most outstanding fighter or reconnaissance squadron' in USAFE for 1977, and by selection of the 50th TFW to provide the USAF tactical fighter element within the FOURATAF Team for TAM '78 (see pages 440-449, this issue). While it was immediately apparent at the conclusion of the exercise that the 'flying productivity' during 'Salty Rooster' exceeded anything in recent history, the contribution which has been made to USAFE planning will ensure continuing future benefit from the evaluation. Overall, the exercise had clearly demonstrated the teamwork which was possible between operations, support and maintenance personnel, and the success of the integration into the host organisation of the augmentees brought in as reinforcements from the US and other USAFE units. The participation of the Air Training Command instructors from the US had been particularly useful for the extra experience they could impart to trainees, which would in turn improve the quality of the 'product' at the front-line in future years. Hard work it had certainly been (one augmentee was reported to have said he would look back on the visit to Hahn with the recollection that he 'spent a year there one month'), but 85% said they would be happy to return again to Europe and 50% reckoned they would apply for a posting to USAFE.

Hahn had certainly 'hacked' the 'Rooster', cutting it down in size until at the end of the exercise it looked more like a spring chicken. And the final endorsement of the product? — the Wing Information Office received only one complaint about the noise!

British Isles' airports: No 4

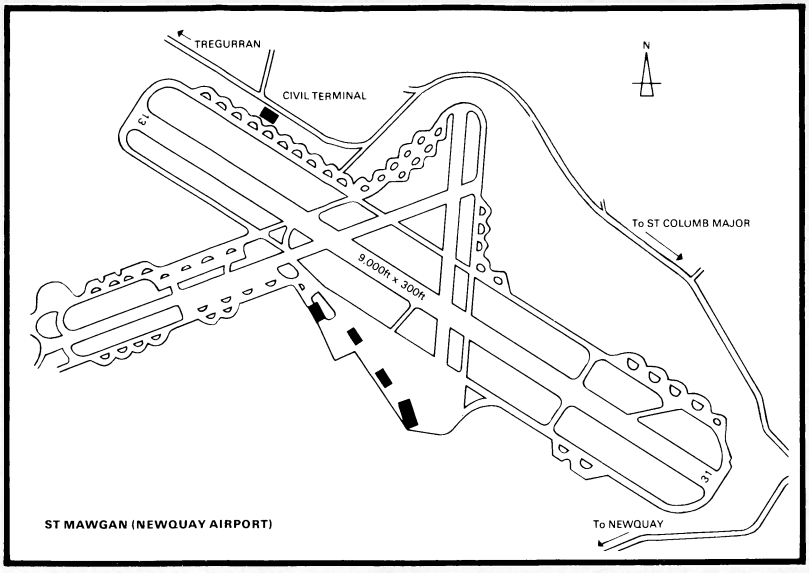
Newquay Airport

R. C. B. Ashworth

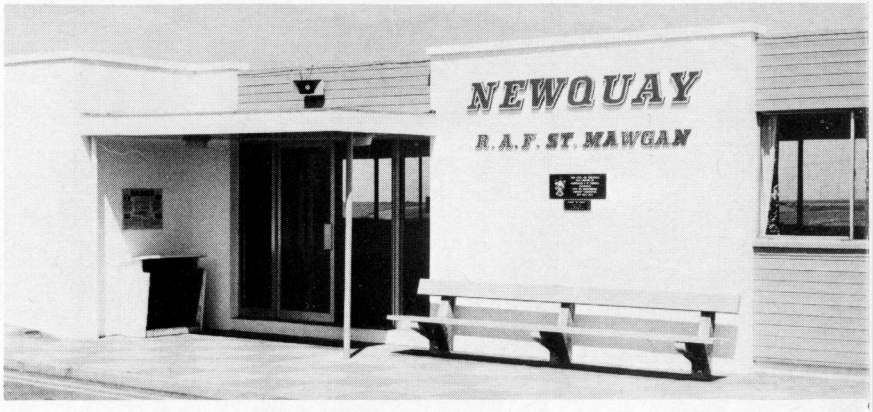
ON THE NORTH side of the large Royal Air Force airfield of St Mawgan is a small cluster of buildings boldly sign-posted 'Newquay Airport'. At periods during the day and nearly every night, a blue, yellow and grey Handley Page Herald of Brymon Airways can be seen on the tarmac outside these buildings. It is there because of the courage of a number of small airlines, the co-operation of the Air Ministry (now Ministry of Defence) and above all, the dogged efforts of the authorities in Newquay who first mooted the idea of a scheduled air service to London in the 1930s.

The initial attempt to connect Newquay with the more populated parts of the country was made in May 1939 when the first Swansea - Barnstaple - Newquay - Penzance schedule was flown by a de Havilland Dragon of Western Airways. A large field near the hamlet of Trebelsue, some 2½ miles north-east of the town, was used as an 'airport' but the outbreak of war in September 1939 put an immediate stop to this enterprise, and it was to be ten years before the post-war efforts of the Newquay Rural District Council to re-establish a service began to bear fruit.

By this time the original landing ground at Trebelsue had been swallowed up by the large military airfield of St Mawgan. Closed by the RAF in 1947 the airfield was in a poor state, but permission was granted for a portion of the main runway to be used for pleasure and charter flying during 1949, and in 1950 an agreement was reached for Finglands Airways Ltd to start a Saturday scheduled service from Manchester using an Avro Anson. The first flight arrived on 24 June 1950 and following the award of a BEA Associate Agreement the



ST MAWGAN (NEWQUAY AIRPORT)



Facing page: The unpretentious main entrance to Newquay airport terminal. Note the plaque commemorating the opening of the rebuilt reception area in 1965.

Centre: Rapide G-AJCL photographed during a refuelling stop in September 1965: British Westpoint Airlines inherited the aircraft when it took over the defunct Mayflower Air Services, and operated it on the Newquay-Scilly Islands route.

Bottom: Another British Westpoint aircraft, Douglas DC-3 G-AMDB, at Newquay in 1964.

This page, below: BMA DC-3, G-AOGZ, still in Derby Aviation colours, refuelling at Newquay in August 1966.

Bottom: British Eagle BAC 1-11s (the photo shows G-ATVH *Serene*, a srs 200 aircraft) took over the airline's Viscount services to London in mid-1966.
All photos in this article by the author

service built up to two round trips a week by the end of the season.

Unfortunately the Air Ministry were not able to allow the use of St Mawgan in 1951 because it was being re-opened for military flying. An effort was made to use Perranporth, another disused RAF airfield, during 1951 and 1952, but this did not meet with much success, largely because of its distance from Newquay and the use of unsuitable aircraft. All flights were suspended at the end of the 1952 season.

St Mawgan gradually took over from St Eval as the major RAF Coastal Command airfield in the south-west. It received its first operational squadrons in 1956 and soon afterwards the Master Diversion commitment, which meant that it was open 24hr a day and had increased handling facilities. A small number of private and company executive aircraft started to use St Mawgan and then late in 1958 Starways Ltd of Liverpool informed the Newquay Council that they proposed to start summer tourist services to Newquay from the north of England. It was agreed by the Air Ministry that the RAF could provide handling facilities for such flights, with the proviso that the Newquay Council should take over as soon as possible. The first Starways flight arrived on 6 June 1959 and their services gradually built up using both DC-3 and DC-4 aircraft. By the end of the first season 1,000 passengers had been flown from Liverpool and Glasgow. The route structure was extended in 1960 and by October 1962 the annual uplift of passengers had reached 15,000 from seven major population centres. These greatly increased passenger figures had outgrown the RAF facilities and encouraged the Newquay Council, so with the active co-operation of the Air Ministry a small airport building was constructed on the north side of the airfield between the taxiway and the St Columb Major-Tregurrian road, near the village of Carloggas.

While the Starways service was now well established it was still only a weekend 'holiday change-over' operation and it was left to a new company to produce the real breakthrough, the first week-day service to London. This commenced on 1 April 1963 when Westpoint Aviation Ltd of Exeter started its Newquay-Heathrow service using DC-3s. Later in the same year flights to the Scilly Isles were started by Mayflower Air Services, the first of a succession of operators on this route. Rapides were used at first, but this again was a summer service only.

Starways ceased operations in the autumn of 1963 and were replaced for the summer season of 1964 by British Eagle (Liverpool) Ltd. In July British Westpoint (the re-named Westpoint Aviation) introduced a second daily service to Heathrow and the little airport was becoming quite busy with more small civil aircraft starting to use its facilities. Viscounts had now replaced the older piston-engined aircraft on most of the British Eagle services though British Westpoint were still using the DC-3s.

During the winter of 1964/65 the airport buildings were enlarged at the very reasonable cost of £5,000, the

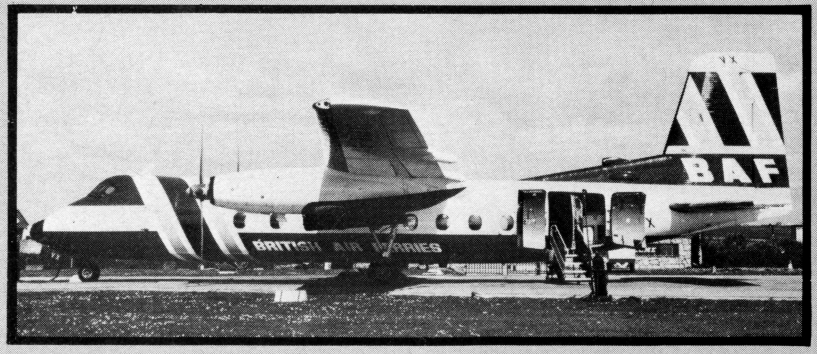
single storey structure now having a reception area and adjoining Manager's office, a waiting lounge and a refreshment counter. It was officially declared open on 22 May 1965 by Alderman T. W. Farrell, Chairman of the Manchester Airport Committee.

British Eagle introduced a weekend London service in 1965 and at the end of the season British Midland Airways (BMA) announced their intention of running holiday flights from East Midlands Airport in 1966, initially with DC-3s but later with Viscounts. The demise of British Westpoint in

Above left: The aircraft which opened the Starways Liverpool-Newquay service on 13 June 1959 was DC-4 G-APEZ — seen here at Gatwick.

Left: BMA Viscount 813, G-AZLR, seen in front of the airport terminal awaiting passengers during April 1976.

Inset below left: Herald, G-BAVX, was leased by Brymon Airways from British Air Ferries for three weeks in April 1977 while the Brymon Herald, G-ATIG, was being modified. No stranger to the airport, G-BAVX, had frequently operated BMA's London service in 1975-76.



Below: The Severn Airways Dove, G-APZU, seen at Newquay in June 1975; the Saturday-only services from Bristol and Cardiff on which it was used were terminated a month later.

May 1966 was a set-back however, leaving Newquay without its scheduled London link yet again. Meanwhile British Eagle introduced the first jets to use the airport when BAC1-11s replaced Viscounts on their London weekend schedules, and both 1967 and 1968 were years of apparent consolidation. This was brought abruptly to an end however with the sudden collapse of British Eagle on 6 November 1968. Dan-Air took over the London service for the 1969 season, though they only provided one return flight each Saturday, using Dakotas and Ambassadors — poor replacements for the plush BAC 1-11s of British Eagle. British Midland restarted their East Midlands holiday services, but the biggest chance to again make the airport viable came when a new company started a weekday schedule on Monday 1 July.

Westward Airways Ltd had been formed late in 1968 by an ex-BOAC pilot, Captain Howard Fry, to operate Britten-Norman Islanders on West Country services with its main base at Newquay airport. The company was granted a licence to operate a network of scheduled services and a most ambitious 'shuttle' between Gatwick and Heathrow. The plan was to leave Newquay in the morning and fly to Gatwick via Plymouth, then operate the shuttle six times daily before returning to Plymouth and Newquay early in the evening. Flying started with a single Islander — Newquay had its own airline at last! A reverse morning schedule was introduced in August following the delivery of a second Islander, and with a loyal clientele built up amongst Cornish businessmen, Westward kept the weekday service going through the winter — a new first for the airport. During the first six months of operation the company carried 5,199 passengers on its scheduled services, though not all of these were to or from Newquay.

The summer services of BMA were expanded during 1970 and included flights from Birmingham, Glasgow and Manchester in addition to East Midlands Airport. The situation was virtually back to that existing in the halcyon days of the Starways operation, though with better equipment in the form of the Viscount 831. Westward continued to expand their services and in July transferred their London terminal to Heathrow. But unfortunately their bright start was not maintained and the company started to make losses, and in September announced that they needed a substantial injection of capital if they were going to continue operations. This was not forthcoming and on 16 October 1970 the company ceased flying, yet another victim of under-capitalisation.

British Midland spent some time examining the economics of a London-Newquay weekday service and finally decided that it was viable using the written-down Viscount 813 fleet which they had purchased from South Africa late in 1971. Their service started on 30 April 1972 and successfully reached a break-even point before being closed down for the winter. Now followed another event which was later to prove very significant. Brymon, a small firm which had re-juvenated Fairoaks airfield in Surrey and built up a training school there, had also been working on Islanders under contract to Britten-Norman. They purchased one in September 1970 and used it for charter work. They were so impressed by its potential that they began to study possible scheduled 'third-level' operations. Despite the depressing example of Westward and the Exeter-based South-West Aviation, they decided that the West Country was ripe for a network of scheduled services and with great courage commenced operations in May 1972 with a Newquay to St Mary's, Scilly Isles route using Islander G-AXXJ. Later in the year a Newquay-Plymouth-Jersey service was started, and these proved so successful that a second Islander was purchased in October and the route mileage steadily increased, using Plymouth as the main base.

All these services were resumed in April 1973 and at the end of the holiday season BMA kept the London-Newquay weekday schedule running. During the winter the Viscount was too large for the traffic generated and on 18 November, G-BAVX, the first of their ex-Trans Brasil Heralds, entered service on the route to provide a more economic solution, especially important now that the cost of fuel was becoming an even larger portion of the total costs. The upsurge in package tours and the improving roads into the West Country caused a gradual fall in the demand for holiday flights from the Midlands and BMA withdrew them at the end of the 1973 season to concentrate on scheduled services. The London-Newquay route was now showing a small profit and by November 1974 the company was operating eight return flights each week.

With the re-organisation of local government which took effect on 1 April 1974, Restormel Council assumed responsibility for the Airport from the Newquay Rural District Council. They did not have the same interest in promoting the operation and negotiations were started with BMA resulting in the airline taking over the running of the Airport on 1 January 1975. The BMA representative, Mr P. G. Barnes took over as Station Manager, and with most of the day-to-day servicing being done at Newquay additional portable buildings began to appear around the terminal. Brymon established a booking and operations office in a caravan and the tidy appearance of the original airport was rapidly being lost. A large car park was built to replace the inadequate lay-by which had previously been the only facility, and car-hire services proved a popular addition, the 'big-boys' being eased out by a fast-growing local firm.

Early in 1975 a new airline, Severn Airways Ltd, announced that it had been granted a licence to fly a route linking Bristol and Cardiff with Newquay on Saturdays. Using Doves the service started in May 1975 but the company was dogged by ill-fortune and went into voluntary liquidation in July. Meanwhile BMA had taken more Heralds into service and the aircraft took over the London route completely from the Viscount on an all-year round basis. Brymon continued to fly their Islanders from Newquay during the April to October months, withdrawing to Plymouth for their winter schedules.

In 1976 BMA rationalised their routes and could not fit the Newquay service into the new schedules. Fortunately Brymon were keen to expand their West Country operations and successfully bid for the London-

Left: Piper Navajo Chieftain, G-MDRB, of Air Anglia used on the new service between Norwich and Newquay, via Birmingham and Swansea.

Right: This Viscount of Skyline Sweden was operated under lease by Brymon Airways during 1977 while the company's Herald was undergoing modification.

Below right: Handley Page Herald, G-ATIG, of Brymon Airways at Newquay airport in January 1977.

Newquay route, purchasing Herald G-ATIG from BMA to operate the service. Brymon Airways, already operating Plymouth-Roborough airport, also took over the running of Newquay airport on 1 January 1977, the smooth hand-over between the two airlines being assisted by Mr Barnes, who remained Station Manager.

Industrial action by BMA engineering staff following some redundancy in the company made it impossible for Brymon to start their new service on the advertised date, for G-ATIG was still at East Midlands Airport awaiting its technical handover. A replacement BMA Herald was provided for the inaugural flight on 3 January 1977 but it became unserviceable, the passengers leaving three hours late in a Viscount. Soon after G-ATIG arrived it had to be withdrawn for modifications and during a six-week period in April and May it was replaced by leased aircraft, first an Air Ferry Herald (also ex-BMA) and then a Skyline Viscount. This was the end of the company's troubles however for since the end of May the Brymon Herald has plodded back and forth to London daily, even managing to fly with little disruption throughout the assistant air traffic controllers' strike during the summer of 1977.

A much needed clean-up of the airport area was undertaken during 1977. An old caravan was removed and the remaining temporary buildings smartened up. The passenger security check arrangements have been steadily improved, the screening being operated by Securicor personnel. The secondment of Mr Barnes was terminated in the autumn of 1977 and Mr M. F. Johnson, previously at Plymouth with Brymon Airways, took over as Station Manager.

For the 1978 summer season which started on 21 March the number of Herald flights increased, initially to ten, and from 1 June to 12 a week in each direction. The summer schedules to the 'Scillies' continue to be flown by the trusty Islanders during the week, but on Saturdays are replaced by a Twin Otter, which also provides a Plymouth link with Newquay.

What of the future? The airport has gradually evolved from a purely seasonal holiday facility for visitors to the town of Newquay, into a fully-fledged unit serving the whole of the Cornish peninsula. The scheduled service to London seems to have settled down and is undoubtedly a boon to businessmen, allowing travellers to London a full day in the capital without exhausting overnight train journeys, and those going to Cornwall a quick flight at a convenient hour.

During 1977 Brymon carried some 25,000 passengers on the London-Newquay route and is reported to make a steady profit. The company is now firmly West Country-based at Plymouth and so the Newquay operations are not just peripheral services as far as it is concerned, but a lynchpin in their whole network. An indication of the company's confidence was the purchase of a second Twin Otter early in 1978; a confidence which augurs well for the future.

Air Anglia started a new service in April 1978 flying a Piper Navajo Chieftain from Norwich to Newquay via Birmingham and Swansea each weekday. The timetable allows for the aircraft to reach Newquay at 1245hr, leaving again at 1350hr on the return flight. It will be interesting to see how this enterprise works out for at present there seems little demand for such a service. However Air Anglia has been proved right in the past, and it would certainly be viable if the current oil exploration in the south-west produces any commercial fields.

The number of air taxis and private executive aircraft using the airport has fluctuated over the years but shows a gradual upward trend, and there is now hardly a day goes by without at least one aircraft in the Twin Comanche to Navajo class on the tarmac; and jet aircraft are not uncommon. Many ot these aircraft have foreign registrations showing the strong European interest in Cornwall in general, and its china clay and mining industries in particular.

The airfield remains a Master Diversion and its single 13/31 runway is one of the best in the country, having been built during the War for ferrying aircraft from the United States and made specially large for that purpose. Now 9,000ft long and 300ft wide, it is equipped with full approach and runway lighting, and has ILS on the 31 approach, with back-up Precision Approach Radar (PAR) on both runways.

This fully-equipped all-weather airfield must surely be the envy of every regional town and with the continued co-operation of the Ministry of Defence there seems to be no reason why Newquay Airport should not continue to prosper now that it is firmly established as the air gateway to the whole of the penisula. Certainly its operators deserve good fortune; the struggle to get it on a sound footing has been long and hard.

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SKYLINE SWEDEN
G-AZNH

BRYMON
G-ATIG

AAFCE TACTICAL AIR MEET 1978

The Editor *reports from RAF Wildenrath*

PRESENTING THE trophy awards at the conclusion of this year's new-style Allied Air Forces Central Europe (AAFCE) Tactical Air Meet, General William J. Evans, COMAAFCE, described the Central Region Air Forces as 'the cutting edge' of the NATO alliance's deterrent posture. It was to check the sharpness of this particular blade and the tactics which would be used in wielding it that aircrews from six NATO air forces had gathered two weeks earlier, on 2 June, at RAF Wildenrath in Germany for a combined tactical fighter and air reconnaissance Meet — TAM '78.

The 1978 Tactical Air Meet marked the first occasion on which two of AAFCE's most important competitions had been merged into a single event, replacing both the biennial 'Tactical Weapons Meet' (see *Aircraft Illustrated*, March 1977, pages 102-107) and 'Royal Flush' tactical reconnaissance competitions. Inasmuch as the AAFCE tactical air reconnaissance and tactical fighter roles are closely linked, with the effectiveness of the former providing essential 'groundwork' for the latter, the decision to combine the reconnaissance and ground attack elements in this year's Meet clearly added to the realism of the competition.

The establishment of representative operating conditions for the TAM '78 sorties was a key objective of the Meet, and one which was modified only by the need to adhere to the safety factors applied to such training

Left: GAF F-4F Phantom of JBG36 prepares to depart the flight line in front of a suitably inscribed hangar.

Below left: Two GAF F-4Fs streak across RAF Laarbruch during a mock attack in the tactics phase of TAM '78.

Below: Jaguars of No 20 Squadron lined-up for departure as the seconds tick away to their exact take-off time.

Right: FOURATAF RF-4C Phantoms from the 26th TRW; note the symbolic eye around the camera port on the right-hand aircraft (see also page 445).

Centre Spread (overleaf): Aerial view of the tac recce flight lines at RAF Wildenrath during TAM '78: FOURATAF RF-4Es and RF-4Cs in the foreground and TWOATAF Mirages, Jaguars, and RF-104Gs beyond.
All photos in this article by the Editor

in peacetime. The competition aimed at testing the inter-operability and effectiveness of Central Region air forces by examining the performances of the allied teams during ground attack and reconnaissance sorties which featured specified navigation and target tasks. The Meet itself was also designed to provide a forum for the exchange of information between the participating air forces; it constituted a ready-made 'classroom' for the discussion of air combat tactics, procedures and future developments. Thus the emphasis was on maximising the learning effect of the Meet and boosting further the mutual confidence, understanding and co-operation which exists between the allied aircrews. A further goal in the reconnaissance competition was the maintenance of intensive operations during an off-home base deployment, and while the detachments were supplied with only limited resources by way of aircraft, support facilities, equipment and manpower.

A total of 60 aircraft from six allied nations took part in TAM '78. The competition sorties were mounted from the hangar aprons which were used in the pre-hardened aircraft shelter era at Wildenrath, and the resultant flight lines full of NATO tactical airpower were an impressive sight. Present in the largest numbers were fighter and reconnaissance variants of the ubiquitous F-4 Phantom and F-104 Starfighter; AAFCE's 4th Allied Tactical Air Force (FOURATAF) was solely represented by team members flying these aircraft whereas the TWOATAF participants operated a more varied selection of equipment, including Jaguar GR1s, NF-5As and Mirage 5BRs — a situation which underlined the usefulness of the TAM opportunity for the exchange of views on operating experiences.

The tactical weapons competition continued the 1976 Meet innovation of grouping the national air forces into two allied teams, representing the ATAFs to which they are assigned within AAFCE, and the composition of the ATAF teams is identified in the accompanying table together with the reconnaissance units which took part in the Meet.

TAM '78 PARTICIPATING TEAMS

ATAF/AF	Unit	Aircraft	Home Base	Competition (& Std Part)
		TWOATAF		
Belgian AF	10th FBW	F x F-104G	Kleine Brogel	Tac Wpns (Dual)
RAF	20 Sqn	5 x Jaguar GR1	Bruggen	Tac Wpns (Dual)
GAF	JGB36	5 x F-4F	Hopsten	Tac Wpns (Attack)
RNethsAF	314 Sqn	5 x NF-5A	Eindhoven	Tac Wpns (Attack)
Belgian AF	42 Sqn	4 x Mirage 5BR	Florennes	Recce
RAF	2 Sqn	4 x Jaguar GR1	Laarbruch	Recce
RNethsAF	306 Sqn	4 x RF-104G	Vokel	Recce
		FOURATAF		
GAF	JBG33	5 x F-104G	Buechel	Tac Wpns (Dual)
USAFE	50th TFW	5 x F-4E	Hahn	Tac Wpns (Dual)
CF	1st CAG	5 x CF-104	Lahr	Tac Wpns (Attack)
GAF	JBG35	5 x F-4F	Pferdsfeld	Tac Wpns (Attack)
GAF	AG51	5 x RF-4E	Bremgarten	Recce
USAFE	10th TRW / 26th TRW	4 x RF-4C	Alconbury / Zweibrucken	Recce

AR
469
ZR
565
AR
421
35
75
35
86
35
22
077
074
082

The Belgians, Dutch, Germans and Royal Air Force Germany represented TWOATAF while the FOURATAF Team consisted of US, Canadian and German aircrews. All of the national elements in the Tactical Weapons Competition had their five aircraft complements wearing fin codes A-E to assist the identification of individual aircraft by the competition judges on the ranges and at intermediate en-route points. Some of the aircraft types were new to the Meet this year, notably the RAF Jaguars and the GAF F-4F Phantoms: two years ago the RAFG component in the TWOATAF team had flown the F-4M Phantom and the GAF entries had been entirely equipped with Starfighters.

Top left: Two F-4Es of the 50th TFW climbing out from Wildenrath at the start of a sortie.

Above left: A Mirage 5BR returns to the tac recce flight line.

Left: A last-minute message from the touchline ('May the force be with you') as the CF-104s head out for a competition sortie.

Below: Two AG51 RF-4Es awaiting take-off; note the specially decorated fuel tanks.

Below right: Close up view of the 26th TRW RF-4C shown on page 441 which sported the nose art around one of its camera ports.

The international character of the reconnaissance competition was even more pronounced as instead of participating as national elements within a wider ATAF team, crews from different air forces were assigned to four teams each with five aircraft from the BAF, RAF, RNethsAF, GAF and USAF detachments. All the nations taking part provided air reconnaissance units except Canada — the Canadian Forces do not have aircraft fulfilling this role based in Europe. The recce competition also featured a more diverse selection of aircraft, TWOATAF single-seat types contrasting with the FOURATAF RF-4E and RF-4C Phantoms — the RF-4Cs coming from both the USAF Tactical Reconnaissance Wings in Europe.

TAM '78 was organised in two phases — a tactics phase between 5-8 June and the competitive flying phase between 9-14 June: the first phase was given over to sorties in which the teams practised and evaluated their tactics and procedures, while the competitive phase encompassed the tactical weapons and tactical air reconnaissance competitions proper.

The tactics phase of the Meet featured several innovations this year, in particular the simulation of a hostile air environment for the attack missions. This was set up to test the defensive tactics of the participating teams, whose narrowly defined attack routes were 'policed' by combat air patrols (CAPs) mounted by USAFE F-15 Eagles, RAFG F-4M Phantoms based at Wildenrath, and Belgian Air Force F-104G Starfighters. In addition, the attack crews had to counter ground-to-air threats from Hawk, Rapier and Bloodhound missile units and anti-aircraft artillery, though specialist defence suppression support was available from 'Wild Weasel' Phantoms of USAFE in addition to on-board ECM systems carried by the attack aircraft. While passive jamming of defence systems was not constrained by mission geography, more active methods, such as chaff dispensing were confined to range areas — the use of chaff over open country en-route has had unfortunate consequences as it has occasionally been eaten by cows! Peacetime training constraints (of the non-agricultural type) included those of speed and height — most of the tracks were flown at no more than 480 knots and no less than 500ft, coming down to 250ft on the run in to the targets.

Tactics phase missions were tasked not only on to the ranges but against other targets as well, and a TWOATAF 'attack' on RAF Laarbruch provided a good illustration of the degree to which the national elements in the teams were operating in unison. The attack was heralded by a pair of 'Wild Weasel' Phantoms which pulled up from low-level to make several simulated air-to-ground missile runs at the airfield defences. Fast and low from the other side of the airfield came four F-4Fs and no sooner had they pulled away than four F-104Gs were overhead on an opposite heading, to be followed, from yet different quadrants, by four NF-5As and four Jaguars. The short duration of the attack and its co-ordinated arrival from different points of the compass was singularly impressive and designed to split the attention of the defences in several directions at the same time.

The amount of detailed planning and the extent of international co-operation between the allied air forces became even more apparent during a later opportunity to sit-in on one of the tactics phase briefings during the first week of the Meet. The briefing was given by Sqn Ldr Al Griffin of No 20 Squadron who was to lead a section of four Jaguars as part of a mock attack on RAF Laarbruch. Returning to the Squadron's crew room from an 'international' briefing with his counterpart national section leaders, Sqn Ldr Griffin relayed to his own section the details of the forthcoming mission. In summary form, and after an initial run through the forecast weather and overall timings, the plan unfolded as follows.

It was to be a joint German Air Force/RAF attack with 16 aircraft flying as four sections. Red section consisted of four F-104Gs, White and Blue sections were formed by four F-4Fs from Pferdsfeld and Hopsten respectively and Gold section was to be the four Jaguars of 20 Squadron. The Starfighters would be carrying cluster bombs, the F-4Fs nine retarded bombs each and the Jaguars four free-fall 1,000lb bombs each. The essential aim of the mission was to deny take-offs from Laarbruch for at least three hours. Likely opposition to be encountered included CAPs by F-15s and F-4s, while the ground-based defences were expected to include Rapier missile batteries and AAA —

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both radar guided and optically directed.

Before dealing firstly with the tactics to be adopted in countering these threats, and, secondly, detailing the attack procedures, Sqn Ldr Griffin disposed of certain 'housekeeping' items. Fuel load from Wildenrath was to be 5,040kg with Bingo calls 1-3 to be made at 3,000, 2,000, and 1,000kg remaining. In the event of a diversion from home base on return from the mission, recovery was to be made at Bruggen or Norvenich.

Then, on to the mission profile; Gold section would make a standard departure, crossing the Rhine at Dormagen 6½min out. A free route would be followed to the initial point with the section in 'card' formation, the lead pair side by side and separated by two thirds of the prevailing visibility and the second pair following at the same lateral separation to complete a rectangular plan shape.

The utility of this formation is that any opposing fighters detecting the section are likely to pick up the first pair and turn into the centre of the box, at which moment the rear pair of Jaguars should close and engage. Continuous monitoring of the fin-top radar warning receiver would give advance indications of the presence of 'hostiles'. The section should jink to avoid AAA and any close-in air-to-air gun engagements — the latter can be rendered ineffective when the quarry's backwash envelopes the pursuing interceptor. All in all, the best tactics were to stay low, go fast and use terrain screening.

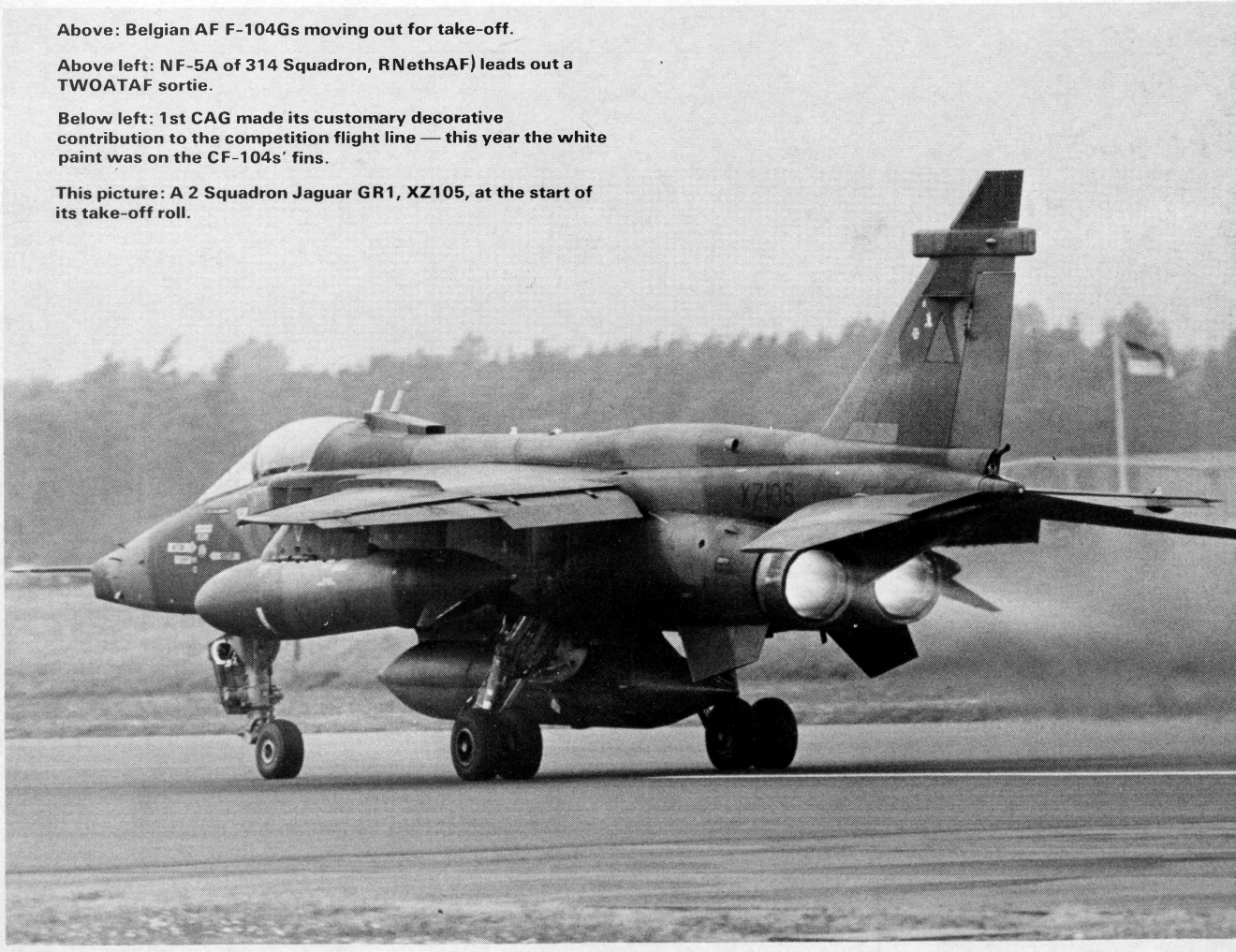
The sequence of the airfield attack, lasting only a few minutes, was to be

Above: Belgian AF F-104Gs moving out for take-off.

Above left: NF-5A of 314 Squadron, RNethsAF) leads out a TWOATAF sortie.

Below left: 1st CAG made its customary decorative contribution to the competition flight line — this year the white paint was on the CF-104s' fins.

This picture: A 2 Squadron Jaguar GR1, XZ105, at the start of its take-off roll.



TACTICAL WEAPONS COMPETITION
Summary Details

(1) Tactical Part

Ranges	:	Elsenborn, Belgium or Sennelager, West Germany.
Mission	:	Navigation to and tactical attacks against assigned targets.
Sorties	:	Both ATAFs 15 sorties, each of four aircraft.
Weapons	:	According to task, each aircraft — 1 x practice bomb, 50 rounds cannon ammunition, 1 x rocket (with inert head)*.
Delivery	:	Options — low level bombing, low angle bombing, strafing, rocket firing.
Briefing	:	Crew briefing 3hr before Time on Target (TOT).
Route	:	Non-standard route to range. Navigation portion will lead to Initial Point (IP).
Navigation	:	Bonus points for overflying IP correctly. Lead aircraft should be over IP (a) within ± 10sec of estimated time submitted before take-off, and (b) within 200m either side of IP position.
Range	:	Flights must meet pre-set TOT within ± 1min. Height and speed over target checked by radar; scores depend on accuracy and timing.
Recovery	:	Standard route from range to base.

(*F-4s and Jaguars did not fire rockets)

(2) Standard Part

Ranges	:	Vliehors, Neths and/or Nordhorn, West Germany.
Mission	:	Full missions (day or night) with navigation and range portions.
Sorties	:	Crews to fly up to five sorties.

(2A) Attack portion

Sorties	:	Attack sections fly single ship or as elements of two aircraft.
Weapons	:	2 x practice bombs, 1 x rocket (with inert head), max 50 rounds ball ammunition.
Briefing	:	Crew briefing 3hr before TOT.
Route	:	Non-standard, low-level route including simulated target along the route, the navigational part.
Nav Target	:	To be overflown within ± 20sec of pre-take-off estimate and within 100m either side of target position.

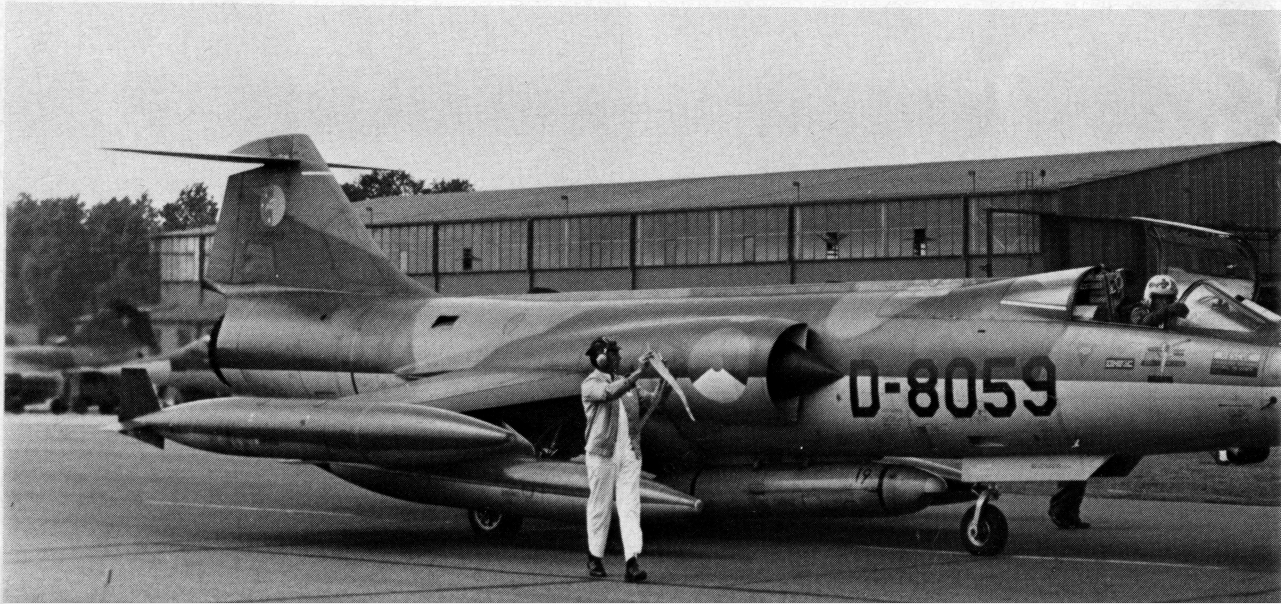
(2B) Dual portion

Ranges	:	Vliehors; possible that 'dual' crews will be scheduled to fly also to Nordhorn during a single mission.
Mission	:	Day and night range missions.
Sorties	:	All 'dual' sorties flown as single ship missions.
Weapons	:	Day mission ordinance to include 2 x practice bombs. Night mission ordinance to include spot charges.
Delivery	:	Dual missions to deliver ordinance under specific speed, manoeuvre and approach conditions.
Navigation	:	Day missions to overfly an en-route point within time and distance requirements. Night missions' navigation accuracy checked by weapon impact on the range.

first the support of a 'Wild Weasel' defence supression strike against the defences, then the F-104s with their CBUs directed against open dispersal areas, followed by the F-4s 'laying' their bombs on the hardened aircraft shelters, refuelling points, etc, and finally the Jaguars. The plan was that while the F-4s made mayhem over the airfield and generally provided entertainment for the point defences, the Jaguars some 3 miles astern would pull up in unison in a 'toss bombing' manoeuvre and lob their 1,000 pounders into the airfield. Delayed action fuses in the bombs were designed to effect their detonation at irregular intervals for several hours after the attack, thus promoting the area denial effect required from the mission.

Returning from the attack, the Jaguars would effect a standard recovery into Wildenrath. A pause for 'any questions', a time check, and Gold section was ready to go.

The actual competitions, tactical weapons and reconnaissance, formed the competitive flying phase which followed the tactics phase as the second part of TAM '78. The principal features of the Tactical Weapons Competition missions are shown in the accompanying table. Most notably, the competition was divided into two parts — Tactical and Standard, with the Standard part comprising Attack and Dual portions. A major difference in these separate



Above: F-4F Phantom of JBG35 from Pferdsfeld.

Right: F-104G Starfighter of JBG33 making a typically fast touchdown.

Below: Arming point check that the safety pins are out as this RF-104G of 306 Squadron stands outside the Reconnaissance Interpretation Centre.

missions was the number of aircraft in each sortie; the Tactical attacks involved flights of four aircraft, the Standard/Attack sorties were scheduled for single ship or two aircraft elements, and the Standard/Dual portion (which could involve two range attacks on a single mission) were confined to single ship sorties.

All the tactical weapons competition sorties involved rigorous navigation requirements as well as attack accuracy and timing criteria on the ranges. During the navigation legs, the sorties had to overfly certain en-route points within very narrow time and distance limits to secure maximum points, the estimated time overhead these locations being submitted before take-off from Wildenrath.

Mission navigation was an equally vital component of the tactical air reconnaissance competition, which tested the four international teams in daylight visual meteorological conditions only. Each team included five aircrew, two Intelligence staff, an Air Reconnaissance Liaison Officer and seven Imagery Interpretation staff. Although the planning of each mission was not timed, the teams were allowed only 15min to accept the task or raise objections to the Chief Tasking Officer: once the task had been accepted, the team was committed to the mission. To make the missions more realistic, the amount of information on which to base target planning was limited to that which might be available in respect of unknown, enemy-held areas. The recce targets were dispersed within tactical and line search areas; in both cases the target areas were required to be flown in a single pass above a pre-ordered minimum speed. The entry and exit points from the target areas as well as the targets had to be photographed or covered on Infra-red (IR) and TOT had to be within plus or minus 1min of the tasked time. After landing, the crews were allowed ten minutes to make their visual reports on each target overflown during the mission and 25min to complete their Mission Reports including photographic and IR imagery.

At the end of the competitive flying phase on 14 June over 500 tactical weapons and reconnaissance competition sorties had been completed. The premier competition award, the *Broadhurst Trophy*, for the ATAF team with highest points from a combination of the Tactical and Standard Parts, went to TWOATAF with 2,468 points, compared with FOURATAF's 2,447 points — the scores clearly indicating that the competition had been keenly contested. TWOATAF also won the *Canberra Trophy* for the best results on the Dual portion of the Standard phase, but the *Vulcan Trophy*, for the best combined performance in the Tactical part and Attack phase of the Standard part, went to FOURATAF. The reconnaissance competition likewise proved to be an evenly matched contest, Team A eventually winning the *Hunter Trophy* with 4,184 points, but only 250 points separated all four teams.

The new format for AAFCE's tactical fighter and reconnaissance competitions, and their combination into a single Meet also incorporating a preliminary tactics phase, provided an important opportunity to test the inter-operability of the allied air forces and evaluate the tactics of the multi-national teams working together. As General Evans confirmed at the awards presentation ceremony, TAM '78 had been 'a learning process with positive benefits.'

Above left: The first Canadair Challenger wide-body biz-jet after roll-out ceremonies on 25 May 1978. The 'bulky' fuselage is clearly evident in this photograph.

Above: The Challenger roll-out ceremony at the Canadair plant. Over 5,500 people attended the occasion which took place just over two years after the aircraft's inception in 1976.

Left: Another view of the twin-engined Challenger during its roll-out; the aircraft's low wing position and deep fuselage are seen to advantage.
All photos via the author

Canadair's Challenger

Brian Walters *reports from Montreal on the roll-out of the wide-body biz-jet*

THE ROLL-OUT OF a new aircraft is an important event in the life of any company, but none more so than Canadair. Although the Cartierville plant of Canadair is one of the best equipped in North America, until the advent of the CL-600 Challenger programme, the company's principal activity had been sub-contract work for US manufacturers producing components for the McDonnell Douglas F-15, the Boeing 747SP and the Lockheed Orion/Aurora. The latest production batch of the CL-215 has been completed and some engine-less examples were to be seen parked into wind awaiting a resurgence of market demand. Latest customer for the CL-215 is Thailand which ordered the type for patrol and search and rescue duties. Canadair is quite accustomed to producing their water-bomber in small batches and fully expects to resume production of the CL-215 in due course.

In the Challenger however, the company has a design which has clearly established itself on the market — even before the test programme has got under way. Conceived little more than two years ago by Bill Lear, the LearStar 600, as it was then called, married a super-critical wing to high by-pass engines to produce a second generation executive jet with a range of over 4,000 miles. Although the basic concept has remained unchanged, the aircraft has grown appreciably; from a 23,000lb design with a fuselage diameter of 88in to the 26,000lb of the Challenger which has a fuselage diameter of 106in. Several factors influenced the final size of the Challenger among them the realisation that the original design would not have sufficient fuel capacity to give the aircraft the required range. The Canadair design team were determined that all of the fuel should be carried in the 'wet' wing and that the cabin must allow a clear 6ft 1in headroom. With the wing out of the way under the cabin floor and the fuselage lines unspoiled by a bulge for the wing, the sums added up to the present figure. Lear was perturbed to see his 'baby' growing to such an extent and he withdrew from the programme to leave further development entirely to Canadair. It was at this stage that the name was changed to the Challenger.

Under the energetic leadership of Harry Halton, Executive Vice-President, the Canadair team went on to produce the new aircraft in record time. As the design began to jell, inputs from the marketing team under the experienced guidance of Jim Taylor (now also a Vice-President of the company) emphasised that there was a demand for a comfortable executive aircraft capable of flying long distances economically. Certainly the mounting orders indicate that the

design team has got the sums right. At the time of the roll-out ceremony at the end of May, orders and letters of intent had reached over 120, a figure which includes orders totalling 31 aircraft for TAG International, a Geneva-based distributor for the Arab world.

The growth in the aircraft's size led to a problem regarding the engine, for the 6,700lb thrust of the Lycoming ALF 502 would not have been adequate for the higher all-up weight. An essential part of the original concept, the Lycoming engine was chosen despite the fact that it had no other civil application at the time. Planned to power the HS 146, the ALF 502 was left without an airframe when the feeder-liner was shelved. Nevertheless as the core of the engine is based on the well-proven T55 engine, Canadair was confident that they had chosen wisely. To provide the necessary additional power, the General Electric submission (a civilianised TF34) was considered but when Lycoming undertook to boost the power of the ALF 502 to 7,500lb st thrust, Canadair decided to retain their original selection.

Based on super-critical wing designs produced by Richard Whitcombe for NASA, the LearStar 600 was designed to exploit the benefits afforded by advanced aerofoils. By delaying the onset of the drag rise which occurs at high Mach numbers, the wing permits high but fuel-efficient cruising speeds. Thicker than conventional wings, the supercritical design is lighter and capable of carrying more fuel for the same wing area. As the result of wind tunnel tests at the NAE facility at Ottawa, the Challenger's wing has evolved considerably, some 20 different designs being considered before the selection of the present wing. Indeed the efficiency of the wing is ascribed as much to the twist as to the aerofoil section. Although winglets were considered and 'test flown' in a tunnel, the Canadair engineers were not satisfied that the benefit of an additional 120-200 mile range would not also bring some disadvantages.

Sheet metal construction of the wings was originally considered but the complexity and fine tolerances of the final design led to the use of milling techniques. Canadair has some of the largest Cincinati numerically-controlled milling machines in North America and so is well able to undertake large-scale production using these methods.

Canadair's experience in the design of high-lift flaps for the CL-84 was put to good use in designing the Challenger and much work has gone into the aircraft's flap and control system. The double-slotted flaps are much like those of the DC-10 and obviate the necessity for leading edge devices. The flap mechanism is housed in fairings made of Kevlar, a plastic fibre material which is used extensively in the production of the Challenger. 'Spoilerons' programmed to the movement of the ailerons aid lateral control while a proportional spoiler system provides for a variable rate-of-descent capability. Finally, 'on-off' spoilers deploy automatically on landing but are prevented from operating inadvertently by an interlock between the flap position and a weight-on-wheels signal.

The LearStar 600 featured a low-mounted anhedral tail but a T-tail has been chosen for the Challenger, a change which did not result in a significant weight penalty. The new configuration has been tunnel tested at angles of attack exceeding 45 degrees without problems. Nevertheless, the company decided to fit a stick pusher in anticipation of demands from the certificating authorities.

The Challenger is being certificated initially to Canadian, United States and French standards and the flight test programme is expected to involve 1,000-1,200hr. After the obligatory 35hr of flight tests based at Montreal, the aircraft will be flown to Mojave, Ca, where about 90 Canadair technicians will use the facilities of Flight Systems Inc. The test programme is expected to be completed by the autumn of 1979 with deliveries following shortly after. The aim is to have the Challenger cleared for operation at heights of up to 49,000ft, and a cruising speed of Mach 0.8 is expected.

The Federal Express letter of intent for 25 stretched Challengers does not mean that Canadair are committed to the development of this version. Further orders will be needed before the company decides to go ahead with the necessary design work. The stretch calls for two 'plugs' totalling 15ft which will bring the gross weight of the aircraft up to 43,000lb. This in turn will call for a further boost in power which may either be met by another increase in the output of the ALF 502 or reconsideration of the General Electric submission. The Rolls-Royce M45 is considered to be an outsider although it is within the required power range. The limited service experience of the M45 is held to be a severe disadvantage. The range of the stretched aircraft would be somewhat less than that of the standard Challenger and leading edge devices may well be necessary. The bigger aircaft would be capable of carrying 50 passengers over 1,500 mile routes as well as meeting the all-cargo requirement of Federal Express.

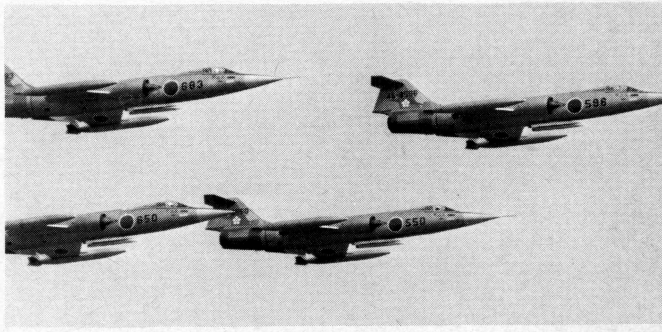
A production rate of seven aircraft per month is planned by Canadair and an eventual demand for a minimum of 500 Challengers is anticipated. If the market shows enthusiasm for the stretched machine, a whole family of aircraft may be developed.

By the time first deliveries begin next year, some $200million will have been invested in the programme, about half of which represents non-recurring costs which will be recovered over 250 aircraft. From the outset, the Federal government has shown an enlightened attitude to the Challenger programme putting up a $70million guarantee when launch funds were required. This sum has now been repaid following a heavily over-subscribed Eurodollar issue on the London market recently. In a speech at the roll-out ceremony, the Federal Finance Minister, Jean Chretien, hinted strongly that the government does not intend to retain control of Canadair indefinitely. The Canadian aircraft industry is currently being studied with a view to returning the major manufacturers into private ownership. Certainly in the Challenger, Canadair appears to have a project which will ensure continued work for many years to come. Wide-body comfort obviously has a market, for some corporations which have only recently received Gulfstream IIs have ordered the Canadian aircraft as a replacement for the mid 1980s!

Bill Lear alas did not live to see the birth of his brain-child but he doubtless would have been proud to have been so closely associated with the first wide-body biz-jet.

Samurai Squadrons

Photographs by
Konan Ase



A selection of photographs showing aircraft operated by the Japan Air Self Defence Force.

Facing page, top: Four F-104J Starfighters of 206 Sqn, 7 Wing taxying out for take-off at Hyakuri AB.

Far left: F-86F Sabre of the Headquarters Squadron at Iruma AB.

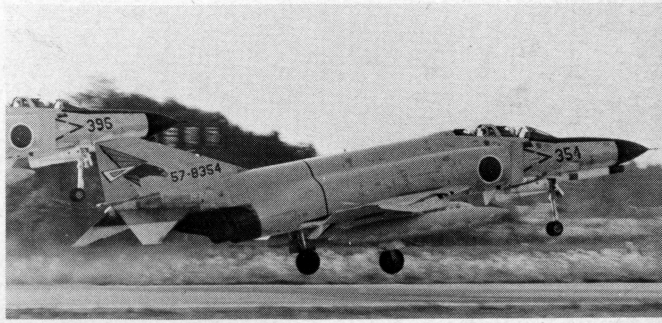
Left: Taxiway view of RF-4EJ Phantom of the JASDF's 501 Squadron at Hyakuri AB.

Below left: Kawasaki KV-107 version of the Boeing Vertol H-46 serves in the long-range SAR role with the JASDF's Air Rescue Wing.

This page, top right: Kawasaki C-1 twin-turbofan transport of 402 Squadron, seen with rear loading ramp and doors open.

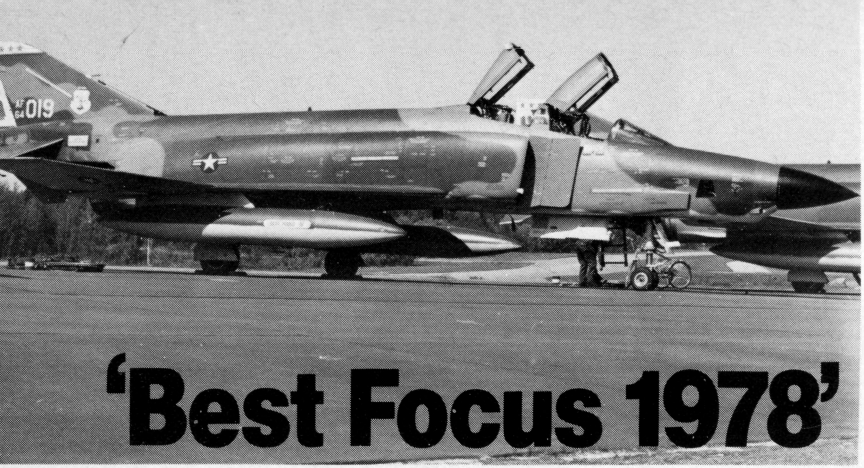
Centre: Flypast by four Starfighters of 206 Sqn, 7 Wing.

Right: Pair of F-4EJ Phantoms of 302 Sqn, 2 Wing scramble from Hyakuri.



Below: Two views of the P2V-7 Neptune Variable Stability Aircraft (VSA) developed by Kawasaki. Its special equipment includes airbrakes inside the bomb-bay doors, side force surfaces mounted on the wings, and direct lift contol flaps.

NOVEL NEPTUNE



'Best Focus 1978'

Cornelis A. de Munck

Photographs by **Pieter Balkhoven**

TACTICAL reconnaissance units of air arms assigned to the NATO Command in Northern Europe — Allied Forces Northern Europe (AFNORTH) — gathered at Rygge Air Station near Oslo on 26 May for a multi-national reconnaissance competition entitled 'Best Focus 1978'. The exercise brought together squadrons from the RNorAF (No 717 Squadron, home-based at Rygge AS), RDAF (No 728 Squadron from Karup), GAF (AG52 from Leck), German Navy (MFG2 from Eggebeck), RAF (Nos 2 and 41 Squadrons from Laarbruch and Coltishall), and two guest units from Canada and the US — a mixed team from Nos 433 and 434 Squadrons at Cold Lake, Alta and Bagotville, Que respectively, and the 152nd TRG, Nevada Air National Guard.

The USAF ANG RF-4C Phantoms stole the decorative honours with their US origin proclaimed on the rudders, underwing tanks carrying the 'Best Focus' title and white painted fin-tops adorned with five stars instead of the usual Nevada identification. The eight RF-4Cs arrived at Rygge from their home base at Reno, Nev after staging through Shaw AFB, SC and completing an eight-hour crossing of the Atlantic. The CF Squadrons flew to Norway via Goose Bay, Labrador and were accompanied on the subsequent trans-oceanic sector by a CC-137 air refuelling tanker.

The missions during the exercise, which lasted until 3 June, were mostly flown over Norway, Denmark and the surrounding sea areas, and consisted of visual and photographic reconnaissance of land and maritime targets. The objective of the exercise was to test the ability of the squadrons in providing accurate and fast response air intelligence data, and the Meet also served to promote the exchange of information between the seven air arms taking part. To further enhance the opportunities for international co-operation, all the teams included one member from each participating squadron.

Above: RF-4C Phantom of the Nevada ANG on the flight line at Rygge AS; just visible on the nearer underwing fuel tank is the 'Best Focus'78' legend.

Left: Close-up view of the decorative tail markings sported by the Phantoms of the Nevada ANG during the exercise.

Below: RDAF RF-35 Draken, AR-109, of No 728 Squadron awaits clearance for take-off.

Bottom: Ground crew loading fresh films into the nose-mounted camera installation of a RNorAF RF-5A.

airbooks

All Ian Allan publications here reviewed can be obtained post free from Ian Allan Mail Order Dept, Terminal House, Shepperton, Middlesex TW17 8AS; please enclose remittance shown and mark envelope 'MO' on top-left corner. It might be possible to supply other publishers' books but first enquire of the Mail Order Dept by 'phone (Walton-on-Thames 28950) or reply-paid letter.

Sopwith Camel — King of Combat

Chaz Bowyer
Glasney Press
ISBN 0 9502825 7 X
11in by 8½in 192pp illus. text
£9.90

Sopwith's legendary WWI fighter is the subject of this lavishly illustrated history by Chaz Bowyer: the excellence of the photographs, mostly unpublished before, the splendid narrative of the aircraft's operational record and the very useful summary of information in the 50 pages or so of appendices, make this book a superb study of the Camel and of the airmen who realised its combat potential. The book traces the origins of the Camel; its service use on the Western Front, over Italy and on other fronts; recounts what it was like to fly and looks at the specialist operations by night and from warships; and covers the fighter's post-war, peacetime use — a scene for which, as the author mentions, it was little suited.

This is a high quality production which will deservedly become a standard reference. **MH**

The Fighting 109

Uwe Feist, Norman E. Harms, and Mike Dario
David & Charles
ISBN 0 7153 7627 6
10in by 7in
198pp illus. text incl. 4pp colour
£7.50

The supply of pictures of the Messerschmitt Bf109 seems inexhaustible, and this new pictorial history of the famous WW2 fighter presents a fascinating collection of almost 300 photographs from German official sources showing all aspects of its *Luftwaffe* service — from insignia close-ups and the nuts & bolts features of maintenance activity, to operational scenes and a gallery of the *Experten* who flew the '109' in combat. The first 100 pages are devoted to an illustrated history of the aircraft's design, development and wartime operations; this is followed by some 75 pages of photographs; and finally, there are appendices referring to *Luftwaffe* fighter unit organisations, major Bf109 variants and sub-types, and the aircraft's weapons systems. Four pages of colour drawings show some of the best known camouflage schemes and unit markings. An absorbing, albeit pricey reference work, and full of superb photographs. **MH**

Royal Navy Instructional Airframes

British Aviation Research Group
ISBN 0 906339 02 2
11¾in by 8¼in 104pp illus. text
£3.95 plus 55p p&p*

A somewhat esoteric subject perhaps, but a very well-produced monograph on a 'behind the scenes'-type subject which can all too easily be overlooked but for, as here, the dedicated and painstaking work of a group of enthusiasts. The result is a wholly admirable compilation referencing RN Instructional Airframes from 1921 to the present day, and largely consisting of a list of the airframes which have occupied such an important place in FAA training over the years. **MH**

* Obtainable from BARG Sales Officer, 32 Nash Close, Cove, Farnborough, Hants GU14 0HL.

A-4 Skyhawk variants

Lindsay Peacock
Alan W. Hall (Publications) Ltd
ISBN 0 89402 036 6
11½in by 8¼in 24pp illus. text
£1.50

The third monograph (following the Thunderstreak and BAC Lightning) in the *Warpaint* series, this publication on the Ed Heinemann's 'Bantam bomber' has been written by noted US Naval Aviation author Lindsay Peacock. As might be expected, it contains a wealth of information on the Skyhawk's service with the USN and USMC, but it also covers all the export variants which have played an important part in keeping the A-4 production lines open to the present day. With a total of 32 photographs, 19 side camouflage drawings, and 1:72 scale plans (the drawings by Ian Huntley are an excellent feature), the monograph is good value for money. **MH**

Air Extra No 21

SBAC at Farnborough — 30 Years in Pictures

The latest issue of Ian Allan Ltd's quarterly magazine *Air Extra*, published on 27 July, is a special issue marking the 30th anniversary of the first Farnborough show in 1948 and tracing a pictorial history of the event since the early post-war years. With over 65 black & white pictures, 11 colour photographs and an extended caption commentary, the issue is a nostalgic reference to the 'stars' of past Farnborough shows from Brabazon to Concorde, Saunders Roe SR A/1 to Tornado, and the 'Black Arrows' to the 'Red Arrows'. (*Air Extra No 22* and other Ian Allan aviation magazines and books will be on display and sale at the company's Farnborough Stand — TP13).

airprints

Squadron Prints

This is a new series of modern military aircraft colour prints from original paintings by Dugald Cameron. Each print shows a single side view of the aircraft in full squadron markings, above a data panel incorporating its identification and a reproduction of the squadron badge. The prints measure 17½in by 10in; they are reproduced on good quality art paper and are most suitable for display purposes as wall decorations, etc.

In producing paintings like this there is clearly a choice to be made as to whether the side views will attempt to reproduce natural lighting conditions and fall-off in subject sharpness as the eye would see it from a distance, or whether to adopt neutral lighting conditions and aim at maximum sharpness in stencils and markings. These prints adopt the former approach, and viewed from a distance they look very effective. On some of the early examples in the series the influence of the directional lighting seems excessive, eg as surface and cockpit reflections, but this appears to have been 'toned' down on later prints to give much better results. The featured subjects range from RAF, RN and GAF Phantoms, to an RAF Bulldog, Shackleton, Lightning and Jaguar.

The price per print is £1 (incl p&p); two prints cost £1.75, 3 prints £2.50 and each additional print 75p. They are available from MAP, 16 Sleaford Road, Cranwell, Nr Sleaford, Lincs NG34 8BY.

Lightning print

A splendid full colour poster of an RAF Lightning has been produced by Tony Paxton from one of his original transparencies. The poster measures 625mm by 435mm and shows Lightning F3, XP753, the aircraft used for the Lightning aerobatic displays this summer.

The print is available from Tony Paxton, 69 Colin Avenue, Grimsby, South Humberside, price 60p plus 20p p&p or, signed by this year's RAF Lightning display pilot, price £1 plus 20p p&p.

Jarrold's Calendar of Aircraft

Our review of Jarrold's 1979 Aircraft Calendar in the August issue of *Aircraft Illustrated*, (page 374) incorrectly mentioned that it was available post free. In fact the price by mail order from Ian Allan Ltd is £0.85 (incl VAT) **plus** 15p p&p.

airshow'78

Peter R. March

PFA International Air Rally, Sywell: 30 June-2 July

The inevitable had to happen sooner or later. After five years of perfect weather for the first weekend in July, 1978 had to turn up with much less satisfactory flying conditions over much of the UK. Low cloud, drizzle and outbreaks of heavier rain, together with gusty winds affected many parts of the Midlands and Southern England at various times during the weekend. This took its toll of participating and visiting aircraft in more ways than one, but nevertheless over 250 aircraft, many of them PFA category types, were present on the Saturday and Sunday, for the big event of the lightplane calendar at Sywell, Northants.

Although the accent of the weekend was very much on the products of a thriving homebuilding aircraft industry, the PFA gave the event more general appeal this year with a Formula One Air Race and displays of aircraft and autogyros. One of the biggest visiting aircraft, Dakota G-ANAF of Air Atlantique, gave a spirited demonstration before returning to Coventry on the Saturday.

Despite the many difficulties, including at least two forced landings en-route to Sywell, the most impressive feature this year was the participation from Europe. There were large contingents from Sweden, France and Switzerland as well as a selection from Holland, Belgium, Denmark and Eire. Several types new to Sywell are particularly worthy of mention including the prize-winning Guex Rekcub, Pottier P70S, Pazmany PL2, Steen Skybolt and Supercab. Although there were many modern aircraft present the vintage scene was not so well portrayed this year and the honours went to replicas rather than original machines. Neatly sitting astride this was the Mew Gull G-AEXF which has been largely new-built from very decayed remains and now more nearly resembles its original pre-war shape.

The PFA judges again had a hard task in deciding who should receive

the various awards and trophies with so many top quality aircraft to scrutinize. A very popular winner of the *Air Squadron Trophy* for the best homebuilt aircraft was Michael Beach from Twickenham with his magnificent SE-5A replica G-BDWJ. This machine was shown last year at Sywell on a trailer in a very advanced state. It was confidently flown in the flying display, looking and sounding every bit like a 1919 aeroplane. Second prize went to Derek Burden for his appropriately registered Minicab G-BDGB and a more surprising third place to Don Gibson for his VP-1 G-BFHX. This award was unexpected as the aircraft had not, at the time, made its first flight.

The *Tiger Club Cup* for the best original design went to Jean Claude Guex for his splendid Rekcub biplane. First flown in 1976 it is powered by a 1,600cc Porsche engine. Cliff Annis took two prizes with his Hornet Moth G-ADKK, the *Pilot Trophy* for the *Concours d'Elegance* and the *Moth Club Cup* for the best Moth. He also came second in the vintage aircraft competition for the *John Randall Cup*. It came as no surprise that Messrs Barraclough and Storey should receive this cup for the Mew Gull G-AEXF. The *Doug Bianchi Cup* for the best Tiger Moth was awarded to D. C. Leatherland for the immaculate G-AOEG. Other awards went to the Swedish pilot who made the most meritorious flight to Sywell, and to the oldest and youngest pilots and for competitions. A new trophy, the *Sywell 50th Anniversary Cup* will be presented next year to the PFA's aircraft design winner.

Altogether another excellent weekend, despite the weather, clearly illustrating the strength of the light aircraft movement in this country and in particular the achievements of the Popular Flying Association. Unfortunately the weather again took its toll of the aircraft returning to their home bases. The recently completed Steen Skybolt G-BFHM was badly damaged in a forced landing near Taunton, Somerset, when it ran out of fuel en-route to Lands End. Low cloud had prevented the pilot from making his planned refuelling stop at Weston-super-Mare. It is hoped that the Skybolt will be repaired to appear at a future Sywell event.

Facing page, top: The newly restored Mew Gull passing over Sywell with its flaps down. G-AEXF won the *John Randall Cup* for the best vintage aircraft.

Centre: Guex Rekcub biplane, HB-YAZ, which won the *Tiger Club Cup* for the best original design. Note the 1,600cc Porsche engine which appears to be getting admiring (?) looks from spectators.

Bottom: The prize winning 1935 Hornet Moth, G-ADKK, belonging to Cliff Annis.

This page, above: Second in the competition for the best homebuilt aircraft was Derek Burden's Minicab, G-BDGB.

Below: Winner of the *Air Squadron Trophy* for the best homebuilt aircraft was Michael Beach's superb SE-5A replica, G-BDWJ. *Photos: Peter R. March*

Bottom: The immaculate Tiger Moth, G-AOEG, which won the *Doug Bianchi Cup*. *Photo: Andrew March*

airkits

James Goulding

The First Mirage F1

If I had to give one example of a very fine, well designed and executed kit it would be the new ESCI release of the Dassault Mirage F1 in 1:48 scale. This is the first kit to be issued of the swept-wing French fighter, which to me is a much more attractive aircraft than any of the long series of tailless delta-winged Mirages.

Doubtless, many more kits, especially in 1:72 scale, will follow in the future and Airfix's model should be in the shops this Autumn.

Having a very accurate outline shape, this model also features some of the finest external detail yet seen. All the skin and panel lines have been engraved with fine indented lines which should be a standard for all manufacturers to follow. Actually ESCI kits seen so far in this new range have been quite variable in external detail and moulding quality, and it is evident that the company are employing a number of toolmakers. I would respectfully suggest that ESCI should show this kit to some other manufacturers as an example of the standard required in the future.

Cockpit detail is good, with the ejector seat being made up from four parts. The massive twin-wheel undercarriage units have been authentically scaled down, with separate parts where necessary to provide the correct appearance. A big fuel tank can be mounted under the fuselage, while the wing pylons and wing tips can be fitted with Matra 530 air-to-air missiles and Matra 550 Magic air-to-air missiles respectively.

Of very high quality, the transfer (decal) sheet gives markings for four Mirage F1s. Two are from the *l'Armée de l'Air* operating with *Escadre de Chasse* 2/12 and *Escadre de Chasse* 3/30. Another is in the three-tone camouflage scheme of the Spanish Air Force and the fourth, also a camouflaged subject, belongs to the 3rd Squadron, South African Air Force. Extremely good marking drawings and colour references are given in the instruction leaflet. The colour references give the equivalent Federal Standard FS 595a colour numbers used on the various aircraft and are of great value to modellers who have a set of these colour chips. I wish all kit manufacturers would give these reference numbers, or the British Standards numbers where applicable, instead of merely publicising their own brands of paint. Naturally, one expects them to mention their own paints, but the true paint shade should be given in addition.

This is a very fine kit, and very good value at the moderate price of £2.26.

A fine Henschel

Another very nicely produced kit in the new 1:48 scale ESCI series is the Henschel Hs129 anti-tank aircraft, the 'A-10' of the WW2 *Luftwaffe*.

The outline shape of this model is good and captures the character of this ugly aeroplane. Moulding standard is of a high quality, with accurately fitting components. The copious panel lines have been beautifully engraved, in raised form instead of indented as on the Mirage F1. Cockpit detail is adequate in the small area, but many modellers will probably add other items, such as a harness etc.

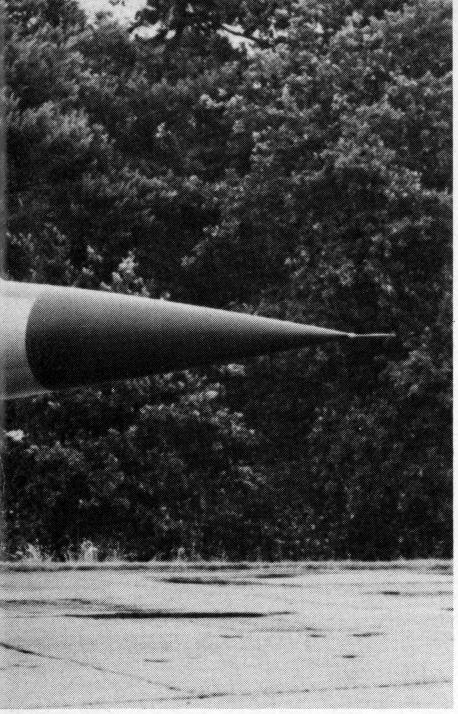
Moulded in a sand colour the whole kit is reminiscent of an Italaerei product and the model is enhanced by such small items as the external aileron hinges and small bomb racks. Alternative parts are given to construct the B-1, the B-2 with 30mm gun in a ventral bath, or the B-3 with the massive 75mm anti-tank gun in a much larger ventral fairing. Two bombs, probably SC100s, are included for carriage on underwing racks outboard of the engine nacelles. Other alternative parts are given for such items as engine intake fairings, exhaust pipes and aerial masts.

Once again, very comprehensive and nicely drawn colour scheme diagrams are given for all the variants. Transfers are supplied for one Hs129 B-1, two Hs129 B-2s and two Hs129 B-3s. The price of this kit is £2.26.

A Navy Lynx

Following the production of a very pleasant model of the definitive service version of the Lynx for the Army, Airfix have now released the equivalent Navy variant. Based on the Army Lynx model, this new kit features all the differences to be seen in the naval helicopter, which include the tricycle undercarriage in place of skids, a different radome in the nose and torpedoes mounted on the fuselage sides.

Moulded in dark blue the new Lynx is a



Above: Mirage F1 of *Esc* 1/12 French Air Force from Cambrai seen at Kleine Brogel, Belgium, during this year's Tiger Meet. *Photo: Herman J. Sixma, IAAP*

Below: Two Mirage F1s under construction at Bordeaux.
Photo: AM Dassault-Breguet Aviation

splendid replica of the fully developed naval version, whereas the earlier Frog and Matchbox Lynx models, although excellent replicas, represent prototype development aircraft. A major difference between the prototypes and full production standard Lynxes is the large single window in each entrance door replacing the three small windows of the original design. Another notable change is that the fin has been redesigned, with increased area and the inclusion of an air intake at the forward part. The main weapons of the naval Lynx are the homing torpedoes which have been well represented.

The markings supplied are for a Westland Lynx HAS2 of No 700(L) Squadron, Royal Navy based at RNAS Yeovilton. This model is in the Airfix Series 3 range and costs 80p.

Modeldecal Sets

Westland/Aerospatiale Lynx markings designed for the new Airfix kit are included in Modeldecal Set No 44, being in this case for a UH-14A Lynx of the Dutch Navy component of No 700(L) Squadron.

A welcome addition to RN Phantom markings, designed to match the Matchbox kit, are the special Silver Jubilee markings applied to the noses of No 892 Squadron's aircraft. Also included are various stencil and label markings, as well as a selection of white nose letters. *L'Armée de l'Air* AD-4N Skyraiders are also featured on this sheet, as are single and two-seat Lockheed F-104 Starfighters of the Japanese Air Self Defence Force, the latter decals designed for the Heller and Hasegawa kits, although only Heller have produced the two-seat version.

Modeldecal Set No 43 also has Japanese Air Self Defence Force markings, in this case for an F-4EJ Phantom of No 302 Squadron. These decals are for the splendid Hasegawa F-4E kit.

Matched to the revised Airfix kit are markings for a Jaguar GR1 of No 20 Squadron based at Bruggen, Germany and another from No 41 Squadron based at RAF Coltishall, UK. Other decals are for *l'Armée de l'Air* F-84F Thunderstreaks and Dutch Air Force F-104G/RF-104G and TF-104 Starfighters.

These decal sheets are well up to the usual superb quality and packed with detail. As a series these sheets are providing future generations of modellers and enthusiasts with a marvellous record of current aircraft colours and markings. It is a pity that such a series of accurate records did not exist during the war years.

A Lockheed PV-1

Another very fine kit has been produced by Rareplanes in their 1:72 scale vacuum-formed series, a comprehensive kit giving parts to build either the US Navy Lockheed PV-1 or the RAF Lockheed Ventura MkII bomber. The British version had extensive nose glazing, additional rear-view blisters on the cockpit canopy and a Boulton Paul turret in place of the Bendix turret. The bulky Boulton Paul turret was an adaptation of the front two-gun turret of the Handley Page Halifax I, and it is pleasing to note that the turret in this kit is not symmetrical, but accurately portrays the slightly less-curved forward face. This gave better optical quality and also merged into the Halifax nose contours.

The mouldings in this kit are, as usual, of a very high quality, with external detail almost as crisp as a well-produced injection-moulded sample. The wing and fuselage halves match well and the thickness of plastic is sufficient to make assembly relatively easy.

The kit does include all the components required to complete the model, but, of course, some items such as propellers and engines, can be replaced by components from existing injection-moulded kits. Underwing long-range tanks are included in the model.

As always in Rareplanes kits, there is a fine three-view detailed drawing in 1:72 scale included on the instruction sheet. This depicts the Lockheed PV-1, but there are inset details of the alternative RAF Ventura II. Colour references are given for the PV-1 of the US Navy, but are not given for the RAF variant. RAF Venturas were painted in Dark Green and Dark Earth on the upper-surfaces, with Sky overall on the under-surfaces. The fuselage code and aircraft letters were Medium Sea Grey when Type A1 roundels were used, but changed to Dull Red when the roundels were changed to Type C1.

airview

Peter R. March

On the land

Wherever you travel in the English countryside during the spring and summer months you are likely to suddenly come face to face with a low-level crop-spraying helicopter or aircraft. Whether it is fertilising newly sown cereal crops in Dorset, 'de-bugging' potatoes in Lincolnshire or protecting trees in Cumbria, there is the busy little machine chasing up and down the fields, dodging pylons, trees and buildings to get its job done. It is a fascinating operation to watch with every minute of time and every inch of wasted movement cut to a minimum. The field to be sprayed is carefully marked out with dayglow signals and the ground team arranges the location of the filler in a field which gives the aircraft the best take-off run with its heavy load. Normally the pilot lands down-wind to complete his landing run back at the loading point. The observer will be surprised at the speed which an aircraft like the Pawnee can deliver its load on to the unsuspecting pests and return for a rapid intake.

The growth of the air agricultural industry in the UK continues year by year. There are more than 30 operators active in the field this year compared with 26 in 1977. Many of them are relatively small in their scale of operations with just one or two machines. The leaders in terms of fleet size are ADS (Aerial) Ltd at Southend, Dollar Air Services at Coventry, Farmair at Headcorn, Miller Aerial Spraying at Wickenby and Westwick Distributors at Ludham. New companies this year include Davies Aerial Applications, Hereford; GSM Helicopters, Ripon; Helicopter Farming, Kettering — all operating Bell 47s; Lawrence Agricultural Aviation Services at Membury with a Pawnee; and Plains Aerial Spraying at Zeals, Wilts with an Agtruck.

By far the most numerous fixed-wing agricultural aircraft in use is the Piper PA-25 Pawnee, there are nearly 60 currently registered, with the latest Pawnee Brave recently making its debut. A long way behind comes the Cessna Ag-variants and the Grumman AgCat with seven or eight apiece. There remains just one example of the LET Cmelak (G-AVZB) in use. Retired Army Air Corps Bell 47Gs and ex-Royal Navy Hiller UH-12Es make up the greater part of the rotary wing element of 40 agricultural helicopters. Dollar Air Services utilising an Alouette (G-AWFY) and a Lama (G-AZNI) from its ex-BEAS fleet provides the only additional types.

Top: Piper PA-25 Pawnee, G-BEXK, demonstrating its water-dumping capacity for fire dowsing at Shobdon on 16 July 1978. Note the crop spraying apparatus mounted on the wing trailing edges.

Above centre: A picture that sums up the competitiveness of the UK air races, as Beta G-AWHX is readied for a dramatic start in the Hereford Handicap Air Race at Shobdon.
Photos: Peter R. March

Below centre: Philip Meeson — the successor to the late Neil Williams as the British Aerobatic Champion — in action in the Marlboro-sponsored Pitts Special G-BBOH.

Bottom: Air Westward's latest Titan Courier II, G-WTVE, at Exeter airport in July. *Photo: Austin J. Brown*

The spectacle of low-level crop spraying has only recently been appreciated by the organisers of air displays in this country. At least two events, at Compton Abbas and Shobdon, have included agricultural aircraft in their programmes this year. At the latter event a novel twist was introduced when two Pawnees of Aero Cropcare not only flew a 'roulette' spraying routine but also showed their capacity as fire fighters by dumping their contents on to flaming bales of hay.

If you look carefully down on the farm, at least in eastern England, you might see something even rarer in the shape of a Polish Mil Mi2 helicopter. Registered SP-SWG and still carrying its Polish Air Force number 544538125, this Russian-designed machine arrived at Norwich via Manston on 1 July. It is being used by a Polish combine harvester manufacturer called Ursus-Bison based at Needham Market near Ipswich to fly spare parts for their machines to farmers in various parts of the country as part of what appears to be an expensive public relations exercise. It made the first of these flights to a farm at Colchester on 11 July, having previously appeared at the Royal Show at Stoneleigh.

Navy up-date

First of all a look back at last month's survey of the Fleet Air Arm. The anticipated order for a new medium lift helicopter has been realised with the announcement that the Royal Navy is to receive 15 Westland Commandos, the first being due for delivery next year. These will be used to form a second commando squadron to operate alongside No 845 Squadron with its Wessex HU5s. It should have been pointed out in the reference to No 846 Squadron that it no longer carries this number, having been down-graded to a support unit and no longer has any Wessex of its own. It is now known as the Naval Air Commando Squadron Support Unit (NACSSU). All operational tasks are therefore catered for by the slightly larger No 845 Squadron. Another not unexpected announcement was for the addition of another ten Sea Harriers to bring the total on order for the Fleet Air Arm to 35. At the time of writing the first Sea Harrier had yet to fly, the programme now slipping back, due largely to the complexities of the new avionics and weapons packages to be fitted. The first of two Hunter T8Ms, XL602, which is fitted with the Sea Harrier nav/attack system, flew at the beginning of the year from Holme-on-Spalding-Moor and is being followed by XL603. On completion of trials at RAE Bedford the two Hunters will be used at Yeovilton for training purposes.

Other Navy news is that the parent squadron for the Sea Kings on Royal Fleet Auxiliaries, such as the new RFA *Fort Grange*, will be No 824 Squadron, currently on HMS *Ark Royal*. The squadron base will be Culdrose from the end of the year when *Ark Royal's* air group is disbanded. The Jetstreams due at Culdrose from September to re-equip No 750 Squadron will be designated T2s. By mid-year four Lynx flights had been formed, the latest being for HMS *Newcastle*. After considerable representation it seems that the Ministry of Defence has relented in its decision to close the RN Aircraft Yard at Wroughton this year.

Mostly racing

Although the year got off to a slow start for the UK air racers, July has seen a good range of aircraft in action at Sywell, Shobdon and along the South Coast. As part of the PFA weekend at Sywell the Federation of Air Racing Associations presented a six-lap Formula One race. Heats took place on Saturday 1 July, with the finals on the following day. A pair each of Cosmic Winds (G-ARUL and G-BAER), Betas (G-AWHW and G-AWHX), and Cassutts (G-BDTW and G-BEUN) as well as Titch G-BCTR took part. The Cassutts, both of which are new to F1 racing this year, were the outright winners. Mike Crossley in G-BEUN *Instant Motion* taking first place at a 208.47mph average speed followed by Steve Thompson in G-BDTW not far behind.

Two weeks later at Shobdon in the 'World of Speed' sponsored F1 race John Mirley was able to edge the two Cassutts out of first place when he flew the rebuilt Cosmic Wind G-ARUL at an average of 201mph. This was no mean achievement for the oldest F1 racer. Mike Crossley closely followed him across the line at 200.57mph with Steve Thompson farther behind at 195mph. It was sad to see the Taylor Titch G-BCTR gallantly fighting on round the six lap course but clearly outclassed as it was lapped by the majority of the other eight aircraft.

The only venue to have consistently presented a handicap air race for the past ten years or so is Shobdon. On Sunday 16 July NJR Heater Services sponsored the 90-mile Herefordshire Handicap Air Race for which there was a modest entry of 14 aircraft. What it lacked in numbers was certainly made up in quality with the return of the veteran racer Mew Gull G-AEXF to an air race starting line. Tom Storey's magnificent rebuild has brought this 1936 racer back for a third lease of life. First built in 1936 for Major A. M. Miller as ZS-AHM it failed to reach South Africa and was re-registered as G-AEXF. After much modification it was raced by Alex Henshaw who also made the famous out and back trip to Capetown in four days 10hr 16min. In July 1939 it was sold in France and was successfully stored at Lyons until 1950 when it was flown back to England by H. E. Scrope. Modified by Doug Bianchi to give it a raised canopy, it was raced by such famous pilots as Nat Somers, Fred Dunkerley and Peter Clifford. The latter flew it to victory in the 1955 Kings Cup Air Race at a speed of 213.5mph, 22.5mph slower than Alex Henshaw's win in 1938. After being damaged in 1965 the Mew Gull did not fly again and eventually passed to a preservation group where it ended up being dumped, and deteriorated rapidly. When taken over by Tom Storey and Martin Barraclough in 1972 they found that almost the whole aircraft had to be rebuilt from scratch. During this major project they took the opportunity to take 'EXF' back more nearly to its pre-war lines, with the sleek cut down canopy being the most noticeable feature. Although it sounded and performed quite well in the Herefordshire Race it was carefully flown in its first race outing and it will probably be some time before it makes its mark to appear among the prize winners.

Another unusual entrant in the race was Kenyan registered Aero Commander 200 5Y-AFT which was flown by a local pilot. The hard fought race was eventually won by champion pilot Frank Pursglove in PA-28R-201T Turbo Arrow G-BEOH, followed by Peter Cremer from Shoreham in Jodel Ambassadeur G-AVIU and Ron Hayter from Southampton in Cessna 180K Skywagon G-BETG. Two pilots had to land their aircraft during the race with mechanical problems including veteran Percy Blamire in his Cherokee Arrow G-AZSF.

Last year it was bad weather which upset Southern TV's South Coast Air Race, this time it was industrial action by the Post Office. As it was not possible to have a live outside broadcast of the race the timing had to be advanced to allow a

recording to be screened. As a consequence only the second stage, the air race from Lydd to Hurn took place. As well as a record number of entrants Jeff Hawkes' Mitchell flew with the race aircraft although it did not actually compete. The outcome of the competitive dash was a clean sweep for Cessnas, taking the first three places, with locally sponsored Frank Spriggs in first place flying Cessna 210L Turbo Centurion II G-BEYV, B. J. Clark in another 210 G-BFLC second, and A. J. Dyer from Elstree third in his Cessna 310Q G-BAUE.

With the World Aerobatic Championships in Prague not far away, there was a good deal of interest centred upon our own aerobatic competition held at RAF Abingdon on 24-25 June. Victory by quite a small margin went to Philip Meeson in his Marlboro-sponsored Pitts Special G-BBOH, giving him the title of British Aerobatic Champion. Challenging hard for second place was Ian Madden also in the Pitts Special and in third place Bob Mitchell in his Akro N81AC. The late Neil Williams had previously won outright the UK's main award, the *de Havilland Trophy* so its place is being taken by a new *Neil Williams Challenge Trophy* sponsored by the *Daily Telegraph*.

International Air Racing & Aerobatics Championships

This new annual occasion for competitive flying and aerobatics will be held at Thruxton on 16-17 September. There will be three main events during the weekend, the 1978 *King's Cup Air Race*, the first British F1 air race to be called the 'British Grand Prix', and the *Masters Aerobatic Trophy*. With no less than 65 entries for the *King's Cup* and a large international field for the Grand Prix air race, Saturday 16 September will be taken up with qualifying heats, and the finals of all the events will take place on Sunday 17 September. Admission charges to Thruxton during the weekend days will be £2 per car, and £1 per pedestrian: public entry will also be possible on the practice day, Friday 15 September, when there will be no charge for admission.

Sywell's 50 Years

1978 marks the 50th anniversary of the opening of Sywell Aerodrome, Northants. The opening pageant in 1928 was held at the height of enthusiasm in this country for the new light aeroplane movement and it drew a crowd of 3,000 spectators. The aerodrome, which then comprised three fields off Holcot Lane on the western side of the present airfield, had only been completed, literally the night before, by the founder members themselves rooting up hedges and levelling the ground. There were no buildings nor at that time any

permanent facilities. These were provided, by the efforts of the members, during the following twelve months. Fifty years later there was the same last minute preparation in hand by a small group of dedicated enthusiasts, but this time it was to prepare for a national event, the annual PFA rally, which was to bring twice the number of spectators and an assembly of light aircraft beyond the wildest imagination of those early pioneers. In 1928 the government of the day was sufficiently motivated to give assistance to the light aircraft movement. Today the PFA and its membership has to paddle its own canoe and the achievements well demonstrated at Sywell during the first weekend in July testify to the success it is having.

The Northamptonshire Aero Club operated the airfield on a very successful basis in the years leading to the Second World War. At the outbreak of hostilities when all civil flying ceased, Sywell became the home of No 6 Elementary Flying Training School of the RAF. At the height of hostilities a fleet of 126 Tiger Moths was operated from Sywell and from its satellite at Denton. During the month of July 1942 the school flew no less than 7,698hr, and was training not only British pilots, but men from France, Belgium and Czechoslovakia. As well as all this there was a Ministry of Aircraft Production factory engaged in the repair and flight testing of battle damaged Wellingtons; and another factory building the Mark II Lancaster. At one time it was proposed to develop Sywell as a full size Bomber Command base with three hard runways. The plan would have involved removing Sywell Wood at the north end of the existing aerodrome, as well as farms and houses. After the war Sywell continued to train RAF aircrew, and at the same time returned to the development of club, private and commercial flying, as well as using the former wartime factories for civil purposes.

Sywell grew to maturity under the management of Charles Newton, and in whose memory a Flying Scholarship Trust has been named. The object of this Trust is to provide flying tuition at Sywell for selected boys and girls from schools in the Town and County of Northampton.

The full story of Sywell's 50 years is told in a recently published book *Sywell — The Story of an English Aerodrome* written by the PFA's President, Air Commodore G. J. C. Paul, price £3 post free from Sywell Aerodrome Ltd, Sywell, Northants. All proceeds from the book are being donated to the flying scholarships fund.

In brief

German Government Canberras 99+34 and 99+35 have been making regular appearances at Southend recently in connection with trials of equipment for aerial photography with Marconi Electronics. Both Canberras are painted orange overall and carry the 'Military Geographic Office' badge on the nose.

Canadian Carvair CF-EPV formerly owned by EPA, which has been standing engineless at Southend since 1975, looks like being preserved. A group of local businessmen have bought it for use as a restaurant. The three remaining BAF Carvairs, G-AOFW (which is stored) G-ASDC and G-ASHZ, are all likely to be sold after the delivery of BAF's first Electra at the end of the year.

At Hurn British Aerospace has received the three ex-Gulf Air BAC 1-11s G-AXBB, G-AXMU and G-AXOX to prepare them for use by BIA at Jersey. The first one is likely to be delivered at the end of September. Air Pacific received DQ-FCR on 25 June. At Via Nova, Argosy E1 XR143 (formerly of W. S. Shackleton) arrived as G-BFVT on 4 July, leaving six days later on delivery to Lincoln, Nebraska. Express Air Freight has changed its title to Express Air Services and taken delivery of all four Heralds. G-BEZB and G-BFRK are based at Hurn, G-BFRJ is on lease to Air Ecosse at Aberdeen and G-ATDS is on a major check.

Two further CASA 352s have rattled into the UK via Hurn. G-BFHF arrived on 28 June and after an abortive attempt to

take-off, night stopped before journeying on to Blackbushe. G-BFHD arrived from Spain on 4 July. In the other direction a pair of Lynx XZ272 and XZ273 headed across the Channel on delivery to the French *Aeronavale* on 6 July and Islander S7-AAC to Mahe on 15 July.

The new T-tailed Pipers are beginning to appear at Kidlington. The Tomahawk G-OATS has been much in evidence and further aircraft were being assembled early in July. The big Lance II has already been represented by demonstrator G-BNJF and G-BFUB. At the aero engineering exhibition on 1-2 July CSE also showed new Long Ranger G-BFTR. The company's responsibility for sales and support of the Bandeirante was also well illustrated with G-BWTV on overhaul in the hangars and Air Ecosse G-FMFC in for minor attention.

Down at Exeter, Air Westward is now firmly establishing its new services and took delivery of Titan G-WTVE in June to bring the fleet total to four while up in Scotland, Loganair is now operating new Twin Otter G-RBLA (Royal Bank Logan Air).

Amongst the new aircraft registrations in May was G-BMSB a Spitfire IX. This is a rebuild of G-ASOZ by M. S. and P. K. Bayliss at Kenilworth. Previously MJ627, this Spitfire was sold to the Irish Air Corps in June 1951 as 158. It was retired in April 1960 and sold to Film Aviation Services at Elstree in 1964. It was dismantled and the wings were used in the rebuild of G-AVAV. It is hoped that the resurrected aircraft will be ready for final touches by Alvair at Coventry in the autumn.

While on restorations, the RAF Museum quietly received another aircraft in June when Cierva C-30A SE-AZB arrived at Cardington. It had been shipped from Sweden via Tilbury Docks and is to be restored for exhibition. This autogyro was in fact an Avro Rota 1 built as K4232 and one of a batch supplied to the RAF between August 1934 and May 1935.

The Anson T21 WD413/G-BFIR made a very welcome appearance at the Shobdon display in July after quite a lengthy overhaul at East Midlands. This is one of just a few Ansons that remain airworthy and it is hoped that it will be seen at displays up and down the country in the near future.

Although the film requirements for the five TB-25N Mitchells had been completed by mid-June these vintage bombers have remained at Blackbushe in anticipation of further work. Two of them, N9494Z and N86427, have appeared at displays at Duxford and Bournemouth respectively, in the capable hands of Jeff Hawke. He hopes to keep both of these aircraft in the UK if a suitable base and customer can be found. The reports of a possible two-part NBC film using a wide array of WW2 aircraft in its flying sequences sounds promising.

Missing from the Practavia Pilot Sprites listed in the *Airview Special* on home-builts in the July issue of *Aircraft Illustrated* was G-BCVF which appeared at Sywell. Built by Frank Rycroft and Barty Castle at Barnet 'CVF' was first flown on 17 June. It had taken nine years to build and is finished to a high standard.

After the deployment of F-105s to Sculthorpe, RF-4Cs to Coltishall and B-52s to Marham, the USAF sent A-7Ds from the South Carolina Air National Guard to Wittering in July for a two-week detachment. The aircraft came from the 157th Tactical Fighter Squadron/169th Tactical Fighter Group based at McEntire ANGB, Columbia, S.C. They flew standardisation missions and made extensive use of the Wainfleet and Jurby ranges.

Exchange visits and deployments of this kind are becoming more and more common, particularly between NATO-assigned squadrons. This is not only restricted to fixed-wing aircraft, helicopter squadrons have also been taking part in visits and exchanges. Earlier in the year OH-58 Kiowas of 444 Squadron CF visited Colchester Barracks; a pair of Italian Air Force AB204s (MM80356 and MM80337) visited the CFS at Shawbury at the end of June and early in July a German Navy Sea King 89+58 of MFG-5 deployed to Prestwick to operate with 819 Squadron. Two Do-28 Skyservants brought in ground crews for the visit and had a longer stay than expected as the German Government grounded all Skyservants after their arrival until the fleet had been inspected for tailplane and elevator fatigue cracks.

Finally, the organiser of the **Warbirds Rally** planned for **Booker** on **3 September** has asked us to point out that reluctantly he has been forced to cancel the event. You are reminded that the **Shuttleworth Trust Flying Day** on **24 September** is a major event to mark the 50th Anniversary of the start of the Collection. Weather permitting most of the airworthy historic aircraft kept at Old Warden will be flown.

For some of this month's contributions we are indebted to A. J. Brown, D. A. Conway, A. J. Cunningham, J. Guthrie, P. Kelsey, I. MacFarlane, A. P. March, S. Murdoch, K. A. Saunders, E. A. Shackleton, D. Spurgeon, S. R. Stynes, R. Wright and the Popular Flying Association. Also the publications *Air North, Air Scotland, Air Strip, Aviation Ireland, British Aviation Review, Flypast, Irish Air Letter, Prestwick Air Letter, Scottish Air News, Skyward* and *South West Aviation News*.

Above left: Cierva C-30A autogyro, SE-AZB, which arrived at Cardington in June for restoration for the RAF Museum. *Photo: Keith A. Saunders*

Below: Anson T21 WD413/G-BFIR making a low-run at the Shobdon display on 16 July 1978.

Bottom: German Navy Do-28 Skyservant 59+15 at Prestwick on 4 July 1978, awaiting clearance to fly back to Germany after being temporarily grounded. *Photo: Peter R. March*

Left: North American B-25J Mitchell *Marvellous Miriam*, 151645, landing at Little Rissington on 1 June 1978 during the filming of *Hanover Street*. *Photo: S. G. Richards*

Right: Fine left hand side view of *Miami Clipper*, 151451, a B-25 which has featured in this year's UK airshow season. *Photo: Austin J. Brown*

Flying in 'Hanover Street'

Adrian M. Balch *reports on the B-25 Quintet at Little Rissington*

AT THE BEGINNING of May, five B-25 Mitchells arrived at Luton Airport, following an Atlantic crossing. They were painted in various colour schemes, but were sprayed olive drab overall with grey undersides and USAAF markings for the film *Hanover Street*. To add the final touch, each aircraft was adorned with a typical American-style pin-up girl on the nose. All the B-25s were 'modified' to represent armed B-25Js with dummy guns, perspex turrets and odd bits of hardboard here and there. When completed, they flew to Bovingdon to start the filming of *Hanover Street*, which is a wartime love story. Bovingdon has been the scene of many aviation films including *633 Squadron* and *Mosquito Squadron*, so the background may look familiar to the ardent aviation filmgoer. For the occasion, the tower was painted olive drab and had to have a few windows replaced which had been smashed by vandals. There were similarly-coloured billets nearby, all adding to the authenticity of Bovingdon as a USAAF base. The filming was completed there by 29 May and in the late afternoon of the following day, all five Mitchells got airborne, following a gash repair job to '151724' (N86427), which lost its upper turret and had engine troubles.

Setting course for Little Rissington, or Imjin Barracks as it is now known in Army hands, the B-25s arrived about 18.30hr and the film and air crews got settled in. Little Rissington was to be used to portray an 'enemy' airfield — a far cry from its Central Flying School days!

The following morning, the cameras were all set to roll, but one or two of the aircraft were rather low on fuel. One of the American pilots asked me where he could get some from, so I suggested Staverton and knowing their runways and radio frequency off-by-heart, I was asked to go along on the trip as a 'guide'. I didn't know at the time, but I let myself in for more than I bargained for. I said good-bye to my wife and daughter, thinking I was just flying over to Staverton, refuelling, then returning.

In tee-shirt and jeans, Captain Eric Lorenzen started up *Gorgeous George -Ann*, as our aircraft was named, and with the odd cylinder 'missing', we taxied out to the end of the runway. I was clinging on to the back of the seat, since there was no hope of sitting down among the oily clutter on the floor. At the end of the runway, Eric opened the two Wright Cyclones up to full pitch and with a loud clatter, we trundled off down the runway. With fingers crossed I was surprised to find we actually got airborne! Instead of taking up a direct heading for Staverton, we circled the airfield while Piper Aztec, G-BJDH, got airborne. This was the camera ship used by the film company and it had a large camera mounted underneath its belly. The Aztec formated with us and took some air-to-air test shots, coming extremely close at times — no doubt for a close-up of the pilot's eyes! Once the film crew were satisfied, we climbed to 4,000 feet and dropped some parachutists, which was filmed from the ground. The Aztec left us and we set course for Staverton. During the flight, I found the manufacturer's construction plate, which was rather rusty but still legible. It showed our aircraft (NL9494Z) as being ex-USAAF 44-30925 and built at Kansas by North American.

As might have been expected, the sight of a Mitchell at Staverton caused quite a stir — no one recalled seeing one there since the war. While our aircraft was replenished with fuel and oil (which it was also leaking!), we downed a quick drink then prepared to depart. The engines spluttered into life and we back-tracked down the runway. Once again, the throttles were opened and we rolled down the runway. To my amazement, we actually got airborne once more! On reaching Little Rissington, we called the film company on their VHF frequency and found we were required to take part in some rehearsals prior to landing. These rehearsals included being 'shot at' from the ground, which was not quite what I had expected. After several passes over the airfield with the bomb doors open, the time had come for the 'enemy defences' to open up. After a glance to the heavens and a little prayer, I suddenly found the aircraft surrounded by balls of fire and puffs of black smoke, as the 'flak' exploded around us. The run was repeated before, with a sigh of relief at not being hit, we turned downwind still in one piece, on to finals, and then made a rather bumpy landing after an hour's flight. As we taxied in, the engine cylinders started popping again and I was rather glad when we reached a standstill. Although the engines had stopped, I continued to hear them for the next hour in my 'still-singing' ears.

Although rather nerve-racking at times, I wouldn't have missed that flight for anything. The five Mitchells involved in the film production were all TB-25Js, serialled as follows:

US Reg	Film s/n	A/c name
N9115Z	151645	*Marvellous Miriam*
N86427	151724	*Brenda's Boys*
N7681C	151790	*Amazing Andrea*
N9455Z	151863	*Big Bad Bonnie*
NL9494Z	151632	*Gorgeous George-Ann*

Miami
Clipper
151451

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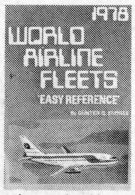

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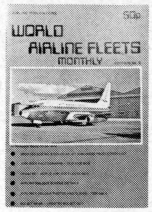

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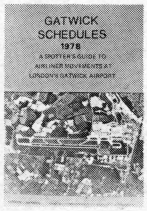

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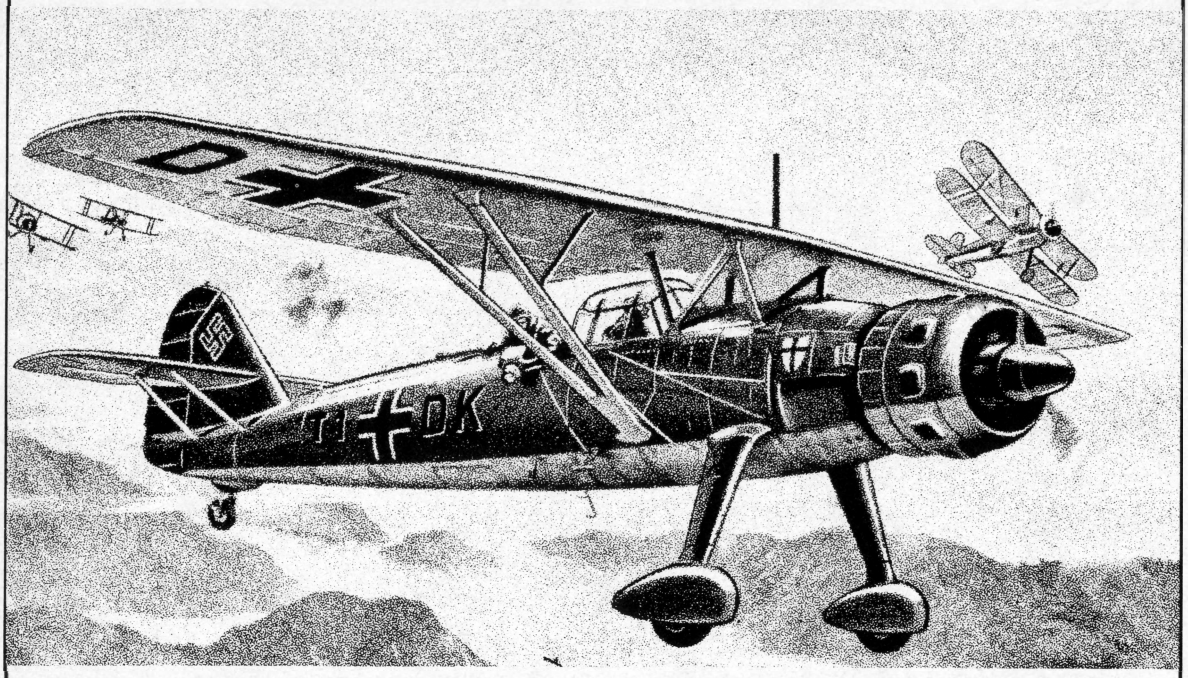

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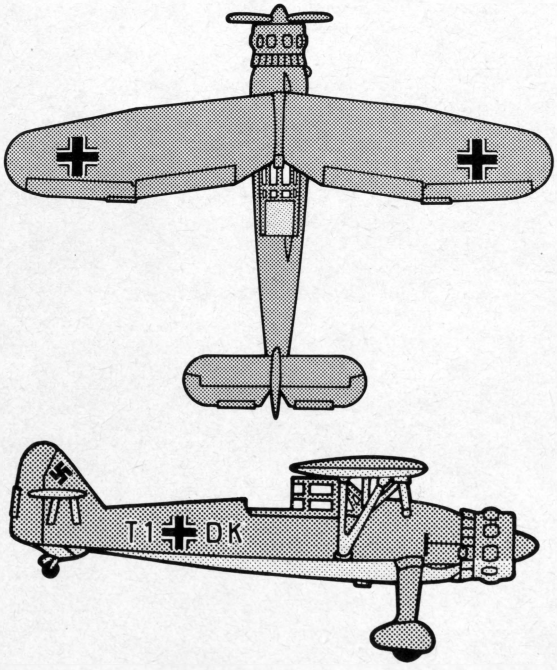

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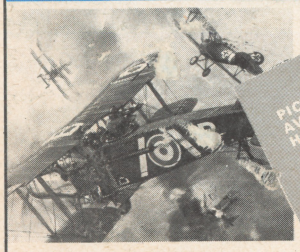

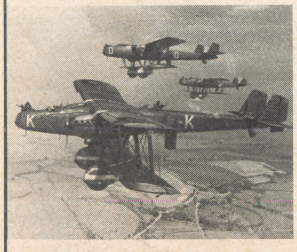

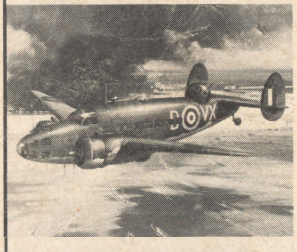

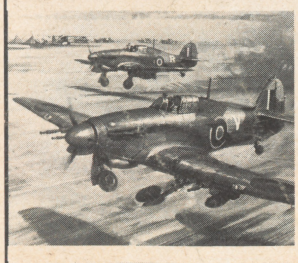

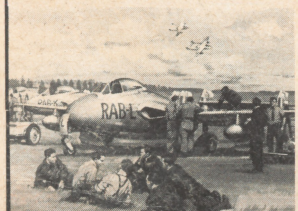

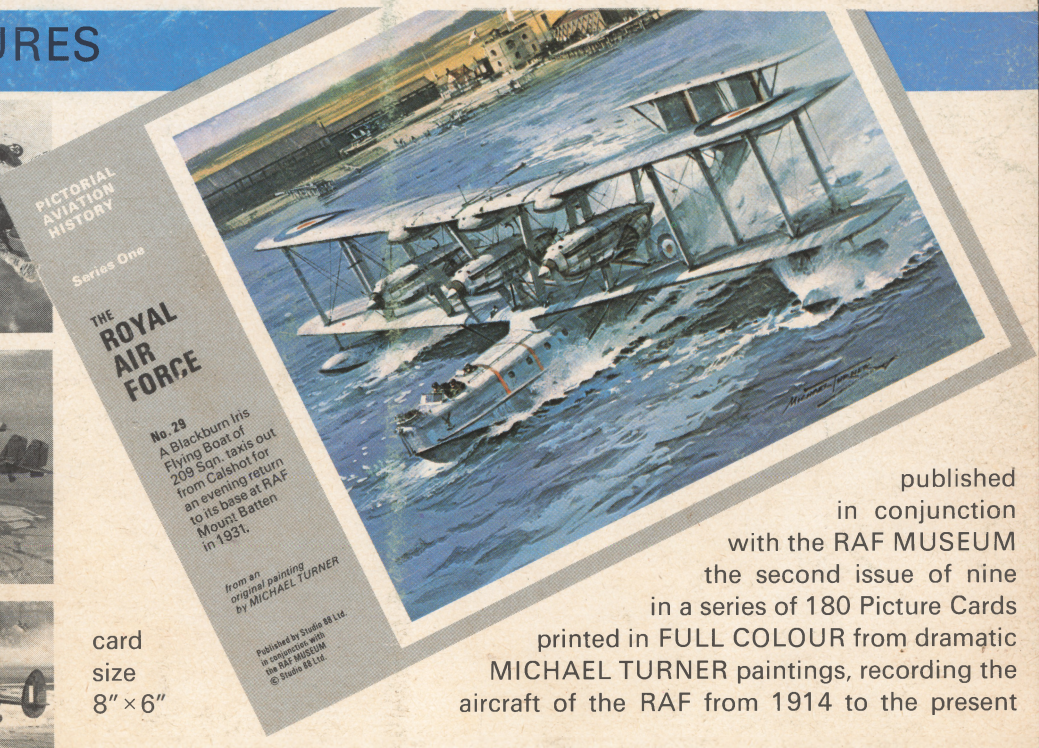

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